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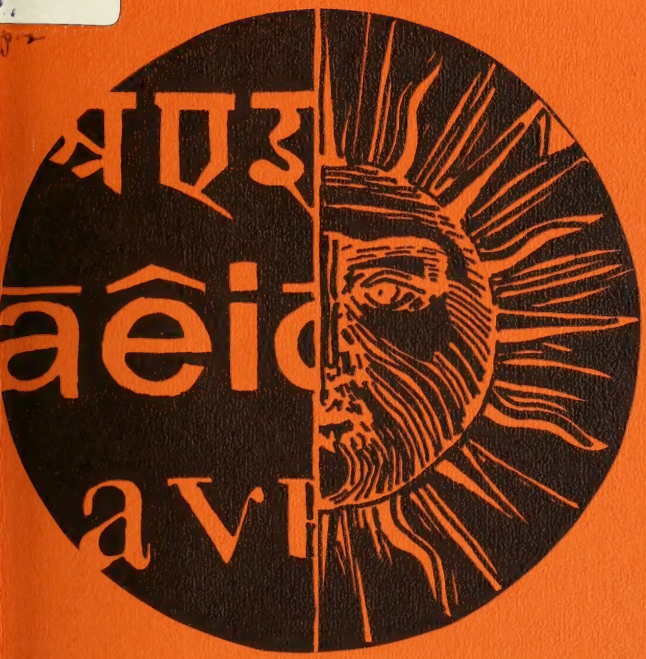

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# STUDIES IN THE LINGUISTIC SCIENCES

VOL. I NO. I, SPRING, 1971

DEPARTMENT OF LINGUISTICS
UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS, 61801

# STUDIES IN THE LINGUISTIC SCIENCES

(WORKING PAPERS)

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# PREFATORY NOTE

This volume initiates the working papers of the Department of Linguistics, University of Illinois, Urbana-Champaign, entitled Studies in the Linguistic Sciences. Studies in the Linguistic Sciences is intended as a forum for the presentation, in pre-publication form, of the latest original research by the faculty and especially the students of our department in various branches of the linguistic sciences. Since the papers are in pre-publication form, they should not be quoted without permission of the authors.

In the future, we hope to devote special issues of these working papers to restricted topics in linguistics (e.g., experimental phonetics, semantics, area linguistics), perhaps under guest editorship.

We propose to send future issues of Studies in the Linguistic Sciences gratis to our sister departments. For individuals, there will be a nominal charge to cover postage, handling, etc. All requests should be addressed to Editor, Studies in the Linguistic Sciences, Department of Linguistics, University of Illinois, Urbana, Illinois 61801.

We wish to thank Sue Dennis, Pat Mooney, Barb Weiner, and Jo Wilcock for their invaluable assistance in the preparation of this initial issue.

THE EDITORS

Urbana, May, 1971

NOTES ON CLEFTS AND PSEUDO-CLEFTS

AND OTHER RELATED MATTERS

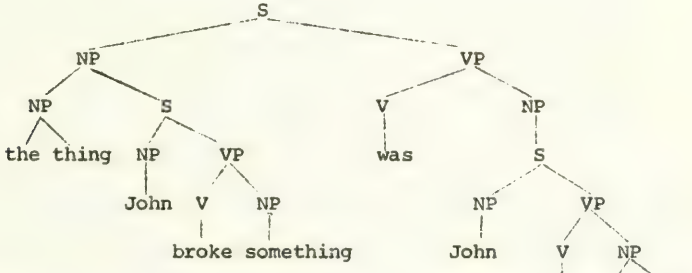
by

Georgia M. Green

Peters and Bach argue in their paper on pseudo-clefts that "a noun phrase can be pseudo-clefted if changing the unclefted sentence by substituting something for that noun phrase and making no other changes leaves us with a grammatical sentence" (1968:5). They use this correlation as part of the justification for deriving pseudo-cleft sentences like (1):

1. What John broke was his nose.

from structures containing a relative clause headed by the thing, as in (2):




2.

by means of a transformation on the order of (3) (I have simplified irrelevant details):

the thing [$_S$ that X Y ] be [$_S$ X' NP Y']

1 2 3 4 5 6 7

⇒ 1 2 3 4 Ø 6 Ø

Condition: 2=5; 3=7

3.

which followed relative-clause formation. Their main reason for including an "unclefted version" of the pseudo-cleft sentence in the underlying structure (cf. (2)) was to guarantee the correct generation of pronominal and case forms which depend on items being clause-mates, without making ad hoc additions to the many rules involved. Although they do not mention it, this would also be necessary, from their point of view, to prevent the generation of such sentences as (4):

4. *What John loves is Mary.

That is, although (5) and (6), and (7) are all well-formed sentences, (4) is not.

5. John loves something.

6. The thing John loves

7. John loves Mary.

Peters and Bach would explain this by saying (1968:5-6) that love in (5) and (6) is a different verb from love in (7), since, for example, the two do not permit conjunction reduction:

8. *John loves Mary and something I drew for him.

and therefore, the pseudo-clefting transformation will block because the condition that terms 2 and 5 be identical will not be met. Presumably, however, it would be possible to derive

a sentence like (9):

9. The one John loves is Mary.

from a structure analogous to (2) where the love's are identical.

What this analysis fails to explain about pseudo-cleft sentences is how there come to be pseudo-cleft sentences such as (10):

10. What I like about John is his sense of humor.

when there is no "unclefted version":

11a. *I like John's sense of humor about him.

11b. *I like his sense of humor about John.

11c. *I like about John his sense of humor.

The Peters-Bach analysis would have to somehow derive (10) but not (12), unless the identity conditions are somehow revised.

12a. *What I like about John is his sense of humor ... about him.

12b. *What I like about John is about him his sense of humor.

12c. *What I like about John is about John his sense of humor.

Now this problem is not restricted to either like or about. Sentence (10) represents an enormous class of sentences, including:

13a. What I showed about John was his resemblance to Harry.

13b. What I showed about John was his tendency to lie.

14a. What I broke of John's was his vase.

14b.*What I broke of John was his vase.

15. What I want of John is for him to clean up.

16. What I want of John is that he clean up.

17. What's wrong with John is his attitude.

18. What's right for John is a stay in the pen.

as well as the better-known:

19. What Bill did to John was steal his book.

20. What Mary did with John was hide him in the closet.

21. What Mary did about her cold was to move to Florida.

Furthermore, the problem of deriving "topicalized" sentences which have no analogous untopicalized version is not restricted to pseudo-clefts. It reappears in cleft sentences, questions, and restrictive adjuncts to non-referential head nouns. Thus:

22. It was his grisly sense of humor that I noticed first about John.

23a. His sense of humor is what disturbs Mary about Sam.[1]

23b. Sam's sense of humor is what disturbs Mary about him.

24. What do you remember about John?

25. What did you do with John--put him in the closet?

26. What did you do to John--put him in the closet?

27. What did you do about John--put him in the closet?

28. What's wrong with John?

29. What's the trouble with John?

30. What's cute about Susy?

31. I know what I like about John--it's his eyes.

32. I like something about John, but I don't know what.

33. There's something about John I like.

34. Everything about John pleases me.

35. Nothing about John pleases me.

36. Do you remember anything about the car that hit you?

37. One thing I like about John is his eyes.

38. The only thing I like about John is his eyes.

39. The trouble with John is his tardiness.

40. The trouble with John is he's always late.

41. The only thing wrong with John is his tardiness.

42. The only thing wrong with John is he's always late.

43. The thing about John that annoys me is his tardiness.

44. The thing that annoys me about John is his tardiness.

45. The thing I like least about Sam is his temper.

Compare (22'-30):

22' *I noticed John's grisly sense of humor first about him.

23a'*His sense of humor disturbs Mary about Sam.

23b'*Sam's sense of humor disturbs Mary about him.

24a'*I remember about John his eyes.

24b'*I remember John's eyes about him.

25' *I put $John_i$ in the closet with $him_i$(self).

26' *I put $John_i$ in the closet to $him_i$(self).

27' *I put $John_i$ in the closet about $him_i$(self).

28' *John has the measles is wrong with him.

29' *He's paranoid is the trouble with John.

30a'*Susy's dimple is cute about her.

30b'*Her dimple is cute about Susy.

(31'-33', 37'-38'):

*I like John's eyes about him.

*I like about John his eyes.

(34'-35'):

*His behavior about John pleases me.

*John$_i$'s behavior about him$_i$(self) pleases me.

*John's behavior pleases me about him.

*His behavior pleases me about John.

36' *I remember the color about the car.

45' ?I like Sam's temper least about him.

It is not clear what the untopicalized versions of (39-44) would be, but it is clear that the Peters-Bach analysis (which, as they point aout, was also independently proposed by Ross) is incapable of explaining these facts. It remains to be seen just what sort of grammatical theory will permit an analysis of pseudo-clefts and other topicalized forms which provides non-ad hoc accounts of

(I) the semantic differences between various topicalized and untopicalized versions:

46a. What the lightning struck was the house.

46b.≠What struck the house was lightning.

46c.≠Lightning struck the house.

(II) the restrictions on the occurrence of animate noun phrases in pseudo-clefts illustrated by the difference between (4) and (47):

4. *What John loves is Mary.

47. What John saw was Mary.

This restriction apparently does not occur in cleft sentences:

48. It is Mary that John loves.

(III) the occurrence of reflexive forms on the right of the copula which are not predictable from their surface structure position:

49a. What John saw was himself.

49b. What annoyed John was himself.

since they are not clause-mates to their antecedents--cf. (50):

50a. *What John saw annoyed himself.

50b. What $John_i$ saw annoyed $him_i$.

50c. *What $John_i$ saw was $him_i$.

50d. *What annoyed $John_i$ was $him_i$.

(IV) the occurrence and position of restrictive modifiers to it, what, thing, -thing, trouble, wrong, etc. in clefts, pseudo-clefts, questions, and so on, which do not show up in untopicalized sentences (cf. examples (10-45)).

NOTE

[1]N.b. the occurrence of the pronoun his in (23a) violates the condition on backwards pronominalization since it both precedes and commands its antecedent.

REFERENCE

Peters, P. Stanley, and Emmon Bach. 1968. Pseudo-cleft sentences. Duplicated, Austin, Texas.

# UNMARKED BLEEDING ORDERS

by

Michael J. Kenstowicz and Charles W. Kisseberth

In his important paper "Linguistic Universals and Language Change",[1] Paul Kiparsky pointed out that the order in which a pair of critically ordered phonological rules apply does not always appear to be totally arbitrary, in the sense that the relative precedence of one rule over another is determined solely by data internal to the language. Rather, it seems that in many cases predictions can be made about the expected ordering of a pair of rules on the basis of the form and function of the two rules involved. In this regard, Kiparsky developed two concepts describing functional relations between rules, in terms of which, he claims, expected orderings can be characterized.

The first of these is termed a FEEDING relation. Two rules, A and B, are in a feeding relationship if one rule, say A, creates structures to which the other rule B can apply. If the ordering of the two rules is such that A precedes B, then a "feeding" order obtains. The opposite order of B preceding A is termed a "non-feeding" order. Chiefly on the basis of the diachronic change of rule reorderings, Kiparsky hypothesizes that feeding orders are more expected, and hence favored over non-feeding orders. That is, it is much more

likely for a pair of rules in a non-feeding order to change into a feeding order than vice versa.

The second concept in terms of which expected orderings are described is termed a BLEEDING relation. Two rules A and B stand in a bleeding relationship if one rule, say A, alters a structure, such that rule B can no longer apply to that structure. If A precedes B, then the order is a "bleeding" order. The opposite precedence relation is termed a "non-bleeding" order. Again on the basis of the diachronic change of rule reordering, Kiparsky hypothesizes that non-bleeding orders are more expected and favored than bleeding orders. That is, two rules in a bleeding order are more likely to shift into a non-bleeding order than vice versa.

And underlying both of these tendencies (i.e. the favoring of feeding over non-feeding and non-bleeding over bleeding orders) is the apparent generalization that rules tend to be ordered in a fashion which permits their maximal application in a derivation. That is, "rules tend to shift into the order which allows their fullest utilization in the grammar."[2] Let us call this the "maximal application principle."

Our purpose in this paper is to point out a relatively well defined set of cases in which bleeding orders appear to be the natural and expected situation. On the basis of such examples we will argue that the principle of maximal application cannot be maintained in its most general and unqualified form.

Before proceeding with the discussion we think it is important to make two observations about the notions of feeding and bleeding relations. The first is that these concepts define a relation between rules only with respect to a given (underlying) form. Hence, a pair of rules may exhibit different feeding and bleeding properties with respect to different (underlying) forms. For example, in Lithuanian there is a rule which degeminates a geminate consonant cluster.[3] This rule accounts for alternations like the following, where the future desinence is /-siu/ and the imperative is /-kite/.

| past | 1 sg. fut. | imp. pl. | gloss |
|---|---|---|---|
| gerė | gersiu | gerkite | drink |
| kasė | kasiu ←-- /kas-siu/ | kaskite | dig |
| teko | teksiu | tekite ←-/tek-kite/ | flow |

Lithuanian also has a rule of Metathesis which interchanges a spirant and velar stop when this cluster occurs before a consonant. This rule accounts for the alternate shapes of a verb stem like /dresk-/ 'to bind' -- dreskė, dreksti inf. (from /dresk-ti/), dreksiu (from /dresk-siu/), and drekskite (from /dresk-kite/). Note that the Metathesis rule feeds the Degemination rule in the derivation of the future form dreksiu by placing the root s after the k in position before the s of the future suffix. However, Metathesis bleeds Degemination in the derivation of drekskite by splitting up the

/k-k/ cluster, which would otherwise degeminate (cf. tekite from /tek-kite/). Thus, the same pair of rules may display different feeding and bleeding properties depending upon the structure to which the rules apply.[4]

The second point to observe is that a pair of rules may exhibit feeding and bleeding relationships in two quite different ways. For example, one rule may stand in a feeding relationship to another rule by virtue of creating new instances of structures which satisfy the conditions to the left of the arrow of the other rule. Thus, in Finnish there is a rule diphthongizing underlying ee to ie. Another rule deleting certain medial voiced continuants gives rise to new instances of ee, which are potential candidates for diphthongization.[5] On the other hand, one rule can stand in a feeding relation with another rule by creating new environments in which the latter can apply. For example, in Russian there is a rule which devoices obstruents in final position. This rule is fed by another rule which deletes a word final l when preceded by a consonant. If this consonant is a voiced obstruent, then it comes to be in word final position by virtue of the l dropping and thus is a candidate for devoicing.

Similarly, two rules can display bleeding relations in the same fashion. For example, certain dialects of German have a rule spirantizing voiced stops in position after a vowel. This rule stands in a bleeding relation with the German rule of Final Devoicing, since the latter alters the feature matrix

of candidates for Spirantization so that they no longer meet the specification to the left of the arrow of the latter rule. Thus, given an underlying form like /tag#/ 'day' (cf taye), there are two possible outputs: tak, if Final Devoicing precedes and bleeds Sprizantization; and tax if Spirantization applies first, a non-bleeding order. Given the marked status of bleeding orders, tax would be the favored outcome, since it allows for both rules to apply. And, in fact, it is from a prior bleeding to a non-bleeding order that the rules have shifted in most dialects that possess these rules in their grammars.[6]

It is situations of the fourth possible type that we are interested in in this paper -- situations in which one rule A stands in a bleeding relation with another rule B by virtue of A's altering a structure so that it no longer satisfies the environmental conditions of B. We shall argue that, at least in the types of cases we shall consider, bleeding orders are expected and favored over non-bleeding orders. We think it is significant that all of the examples of bleeding/non-bleeding orders discussed by Kiparsky are of the first type, where one rule bleeds another by altering the feature matrix of a structure so that it no longer satisfies the conditions to the left of the arrow of the other rule.

The first example we want to discuss comes from the Yawelmani dialect of Yokuts, an Amerindian language of the Penutian family.[7] This language has a rule shortening long

vowels in a closed syllable, i.e. before a consonant cluster or a single consonant at the end of a word. This rule accounts for alternations like the following: do:s-ol 'might report', but dos-hin 'reports'; ṣa:p-al 'might burn', but ṣap-hin 'burns'; ?ile:-hin 'fans', but ?ile-l 'might fan'; hoyo:-hin 'names', but hoyo-l 'might name'. There is another rule in Yawelmani which inserts an i in the environment $C__C\begin{Bmatrix}\#\\C\end{Bmatrix}$. As a result of the operation of this rule, some vowels that are underlyingly in closed syllables come to stand in open syllables. Thus, the Epenthesis rule potentially bleeds the Shortening rule by destroying the closed syllable context of the latter. Given the hypothesized marked status of bleeding orders and the maximal application principle, we would expect Shortening to apply before Epenthesis. However, as it turns out, the Shortening rule must follow Epenthesis, and hence be bled by it. This is shown by forms like the following, which have underlying long root vowels followed by consonant clusters in their lexical representations: ?a:mil-hin, ?aml-al /?a:ml-/ 'help'; mo:xil-hin, moxlol /mo:xl-/ 'grow old'; se:nit-hin, sental /si:nt-/ 'smell'; wo:wul-hun, wo:wl-al /wu:wl-/ 'stand up'.[8] Although Epenthesis bleeds Shortening, this nevertheless strikes us as quite natural. The reason, we suspect, is that rules which shorten vowels in closed syllables typically refer to"surface" syllabic structure, rather than to a more "abstract" syllabic structure different from the surface structure. The fact that Shortening applies only after the

surface syllabic structure has been determined by Epenthesis thus seems quite reasonable. In addition, this preference of shortening rules for surface syllabic structure falls together quite straightforwardly with the parallel generalization that the inverse of Epenthesis --namely processes of vowel deletion -- also typically apply before shortening rules. Thus, Yawelmani also has a rule deleting the final vowel of a CV suffix like the imperative (which is underlyingly -ka) provided the suffix is preceded by a vowel. And if that vowel is basically long, then it undergoes Shortening by virtue of being in position before a final consonant. Hence, we find forms like the following: xatka, from /xat-ka/ 'eat!'; but, hoyok, from /hoyo:-ka/, and ?ilek, from /?ile:-ka/. Observe that here the vowel deletion process feeds the Shortening rule by creating new instances of contexts in which it can apply. This tendency for rules of vowel shortening to follow both rules of vowel deletion and rules of epenthesis is a curious asymmetry for a theory which determines expected orderings by a principle of maximal application. On the other hand, it falls out quite nicely if we say that rules like Shortening typically apply only after the surface syllabic structure has been determined.

The next case we want to consider comes from Tübatulabal, a Uto-Aztecan language.[9] In this language the past tense of a verb is formed by a process of reduplication in which a copy of the first stem vowel is placed to the left of the stem.

For example, polonaːn, opoloːnan 'to beat it for him'; tugaʔanan, utugaʔanan 'to make it deep for him'; kamiːzan, akamiːzan 'to catch it for him'. This language also has a rule neutralizing the contrast between voiced and voiceless stops in favor of the latter. It applies in both word initial and word final position. Such a rule is responsible for the following alternations: puwaːn, uːbuwaːn 'to irrigate it for him'; toːylaːn, oːdoːylaːn 'to teach him'.

Note that the Reduplication rule bleeds the Devoicing rule by making an underlying initial consonant medial phonetically. However, this ordering strikes us as expected, since typically rules of initial and final devoicing apply to segments which appear in such positions phonetically. This order of Devoicing after Reduplication also ties in with the fact that Tübatulabal has a rule which deletes word final vowels. Stops which come to stand in final position as a result of this rule also undergo devoicing. For example, the unsuffixed form of taːwəgaːnat 'to go along causing him to see' is taːwək 'to see' from underlying /dawəga/ (cf. taːwəgat 'he is seeing'). Observe that in the derivation of taːwək the deletion rule feeds the devoicing process by creating new contexts in which it can apply. Given the maximal application principle, we should expect that the copying of the vowel into word initial position should follow Devoicing, while the dropping of the final vowel should precede. The fact that Devoicing follows both rules is an unexpected peculiarity for this theory, but is just what

would be predicted by a theory which says that devoicing rules typically apply to segments which are initial or final in surface representation.

Washo, an Amerindian language of the Hokan family, provides the basis for our next example.[10] Washo has a rule of Stress Reduction which destresses a vowel if it is followed by a stressed vowel. Thus, the stem máln- 'acorn' is destressed in the diminutive malnáːci. Similarly, the stem sésm-'to vomit' is destressed in sesmέwe? 'vomit', where the resultative suffix -έwe? is appended, and in sesmásaʔi 'he's going to vomit', where the near future suffix -ásaʔ- is added.

The Stress Reduction rule operates close to the surface in Washo; consequently, it is fed by the rule of Vowel Drop, which deletes an unstressed vowel in the context V́ʔ__CV. For example, the stem déʔeg- 'stone' appears in its full form (i.e. disyllabic, with a stressed first vowel) when unsuffixed: déʔek; but is reduced in the diminutive deʔgáːci. In the diminutive not only has the second vowel of the stem been lost, but the first vowel has been destressed. Clearly, Stress Reduction operates on the output of Vowel Drop.

But just as the operation of Stress Reduction is necessitated by the loss of a vowel, the insertion of a vowel may render it unnecessary. There is a rule in Washo that inserts ɨ in the context V́C__C$\begin{Bmatrix}\#\\ C\end{Bmatrix}$. This rule accounts, for example, for the fact that a stem like áln- 'to lick' has the allomorph /alɨn/ in the imperative galɨ́n 'lick it!', where no suffix

follows, but /alŋ/ in lálni 'I am licking it', where the imperfect -i suffix follows.

Now note the example kálɨŋmáma?i 'he's finished licking it' where k- is the 3 pl. object prefix and máma?- is a stem meaning 'to finish'. In this form, ɨ-epenthesis operates to insert a vowel within the final consonant cluster of the stem, since a consonant follows. Stress is maintained on both the stem meaning 'to lick' and on the stem meaning 'to finish'. This is accounted for by ordering Epenthesis before Stress Reduction, a bleeding order. The maximal application principle would predict an output with stress only on the first stem by having a derivation in which both rules apply -- Stress Reduction first, and then Epenthesis. However, once again the bleeding order strikes us as natural in this case, since we claim that typically a rule like Stress Reduction will follow a rule like Vowel Drop and also will follow a rule of Epenthesis, even though the former is a feeding and the latter a bleeding order.

A slightly different example occurs in Lithuanian, where there is a rule of regressive voicing assimilation which assigns a value for voice to any number of obstruents equivalent to the final member of an obstruent cluster. Thus, the prefixes /ap-/ and /at-/ alternate with final voiced stops if the following stem begins with a voiced obstruent, as the following examples show: arti 'plough', [ap]arti 'finish ploughing'; dirbti 'to work', [ab]dirbti 'work through'; gyventi 'live', [ab]gyventi 'inhabit'; eiti 'go', [at]eiti 'to arrive'; gimti 'to be born', [ad]gimti 'to be born again'.

In addition, Lithuanian has a rule which inserts i between homorganic stops across a prefix boundary. Hence, pūti 'to rot' apipūti 'to grow rotten'; teisti 'to judge', atiteisti 'to adjudicate'. Now what is predicted by the principle of maximal application if we join such prefixes to stems beginning with homorganic voiced stops? Such a principle claims that both Voicing Assimilation and Epenthesis should apply, in that order. On the other hand, a theory which claims that rules of cluster assimilation characteristically apply only after clusters have been broken up or formed (i.e. after both rules of epenthesis and deletion) predicts that Voicing Assimilation should not apply in the derivation of these forms, since a prior application of epenthesis should break up the cluster and thus bleed the assimilation rule. And, in fact, the latter makes the correct prediction, as the following forms indicate: duoti 'to give', atiduoti 'to give back'; bėgti 'run', apibėgti 'to run around'.

In Klamath, an Amerindian language of uncertain linguistic affiliation spoken in southwestern Oregon, the opposition between glottalized and non-glottalized consonants, as well as between unaspirated and aspirated (voiced - voiceless in the case of younger speakers) consonants, is neutralized before all glottalized consonants and before obstruents.[11] As in Lithuanian, the environment which conditions this rule of neutralization is a phonetic one, not an abstract one. There are many cases where a glottalized or unaspirated (voiced)

consonant occurs in a neutralizing environment in underlying representation, but remains unchanged due to the elimination of the environment by the operation of some other morphophonemic rule.

For example, there is a stem ne:bg- 'to happen, occur', which has the allomorph /ne:pg/ in ne:pga 'happens, occurs'. But when a consonant initial suffix is added, the allomorph /ne:bag/ is found, as in ne:bagwapk 'will happen, occur'. The /a/ in /ne:bag/ is due to a morphophonemic rule which breaks up certain stop clusters in pre-consonantal position. This a-epenthesis rule is just one of a whole set of such rules operating in a variety of environments; all of these rules must precede the rule of Neutralization. As a second example, consider the stem newlg- 'to rule'; the underlying /l/ is neutralized in newlga 'rules' (actually a syllabic /l̩/), but surfaces in the noun newlaqs 'rule' and in newlaqta 'plots against', where a has been inserted to break up clusters with four consonants.

a-epenthesis rules are not the only rules which destroy the environment for Neutralization. In Klamath both glottalized and non-glottalized glides vocalize between consonants -- y-glides alternate with long, tense /i:/, and w-glides alternate with the long, tense vowel /o:/. Consider a stem like mbody- 'to wrinkle'. In pre-vocalic position, the allomorph /mbotʸ/ occurs, as in mbotʸa 'wrinkles'; but in preconsonantal position, we find the allomorph /mbodi:/, as in mbodi:tk

'wrinkled up'. To account for mbodi:tk, the rule of vocalization must be applied before Neutralization, so that underlying /d/ is preserved.

It does not seem surprizing to us that every rule in Klamath that could bleed Neutralization (by operating on an underlying structure where a consonant is in the context for Neutralization and destroying that context) does so. Given a rule that says: neutralize the opposition x in a position y, where y may be a class of segments adjacent to x, it is typical that the position y is close to the phonetic surface rather than close to the underlying representation (in case the two are divergent).

Another example, similar to the Klamath case, occurs in Takelma, also a language of southwestern Oregon.[12] In Takelma the aorist stem of verb bases ending in a consonant cluster is formed by placing a copy of the stem vowel within the stem final consonant cluster: somdan 'I shall cook it', somoda?n 'I cooked it'; tamyanan 'I shall go to get her married', tamayana?n 'I went to get her married'; malginin, 'I shall tell him', malagini?n 'I told him'.

This rule interacts with another rule of Neutralization similar to that of Klamath. The opposition between voiced and voiceless and also between glottalized and non-glottalized consonants is neutralized in favor of voiceless non-glottalized consonants in position before another consonant. Now if we take a verbal base ending in a cluster whose first member is

a glottalized consonant, the principle of maximal application predicts that this consonant should first be deglottalized, and only then be separated from the final member of the cluster by Reduplication. On the other hand, the principle that says that such rules of neutralization typically apply to surface representations predicts that the underlying glottalized consonant will reach the surface by having the consonant clusterbroken up by the copying process. And, once again, the latter theory is corroborated by the facts of Takelma, as the following forms show: lopdia$^{u}$?t 'it will rain', lopodia$^{u}$? 'it rained'; yokyan 'I shall know it', yokoya?n 'I knew it'; masgan 'I shall put it', matsaga?n (a neutralized t's shows up as s) 'I put it'. Here, just as in Klamath, the neutralization occurs only after the surface syllabic structure has been determined, this time by a copying process rather than a rule of epenthesis.

The final example of this type that we want to discuss comes from West Greenlandic Eskimo.[13] It is slightly different from the examples considered so far in that it involves a rule of metathesis, rather than an epenthesis or copying process. However, the generalization that certain types of assimilation tend to operate close to the surface representation still holds true. In West Greenlandic there is a rule which lowers the high vowels i and u to e and o when they stand in final position or are followed by a uvular. This rule interacts with a rule of metathesis, which inter-

changes a VC sequence, if that sequence is followed by a word final consonant: $V\ C_1\ C_2\ \#\ \rightarrow\ C_1\ V\ C_2\ \#$.

These two rules explain alternations like those found in the following singular-plural noun pairs: ameq, ammit 'skin'; nanoq, nannut 'bear'. The stems are basically /amiq-/ and /nanuq-/. The singular forms are derived simply by an application of the Lowering rule. In the plural, which is marked by a suffix -t, underlying /amiq-t/ and /nanuq-t/ first undergo Metathesis to /amqi-t/ and /nanqu-t/. A subsequent assimilation of q to a preceding nasal yields the surface forms. Note that in the underlying representation of the plural forms high vowels are followed by a uvular -- the context for Lowering. To derive the correct surface forms, we must order the Metathesis first, destroying the context of the subsequent Lowering rule. This bleeding order is predicted by a theory which claims that such assimilatory rules tend to apply after the surface syllabic structure has been determined by rules like Metathesis.

Before concluding, we would like to consider one more case of a rather different nature. This example is significant, since the concepts of feeding and bleeding are simply not applicable. On the other hand, our claim that certain types of rules typically refer to surface structure does seem to make the correct predictions.

In both Baltic and Slavic there is an underlying contrast between stressed and stressless morphemes. When a

stressless morpheme, say a noun stem, is combined with a stressed suffix, the word accent occurs on the suffix. Hence, if the stem meaning 'snow' (/snieg-/ in Lithuanian, /sneg-/ in Russian) is combined with a stressed suffix like the dative plural, we find sniegáms in Lithuanian and snegám in Russian. But when these morphemes are appended to stressless suffixes like the accusative singular, then there is a rule inserting stress on the first vowel of the word: Li. sniẽga, R. snégu.[14]

In the evolution of Slavic sequences of a vowel - liquid - consonant underwent a modification such that the liquid and consonant are no longer contiguous, but are separated by a vowel. In South and West Slavic there was basically a simple metathesis of the root vowel and liquid: (C) V R C --→ (C) R V C. In East Slavic the outcome was different. Essentially what happened was that a copy of the stem vowel was placed between the liquid and the following consonant: (C) V R C --→ (C) V R V C.

What is interesting in this regard is to see how this change interacted with the Stress Insertion rule, which places accent on the first vowel of an unaccented word. Given a theory which says that rules of accent placement of the form "place accent on the nth vowel of a word" typically apply only after the surface syllabic structure has been obtained, we would predict that unstressed words with a vowel - liquid - consonant sequence should receive accent on their initial vowel. And, in fact, this is what happened, as evidenced by forms like the

following: Li. /gard-/ 'town'- gardáms, gařda; /galv-/ 'head' - galvóms, gálva; R. /gord-/ - gorodám, górod (cf. zá gorod); /golv-/ - golovám, gólovu.

It is not possible to argue that the Vowel Copy rule copied an unaccented version of the stem vowel in position between the liquid and the following consonant, because underlyingly stressed morphemes of this shape show up with accent on the copied vowel: e.g. Li. /várn-/ 'crow' várnoms, várna; R. /vórn-/ voránam, voránu. Hence, there must have been derivations like the following in East Slavic.

| | /vórn-u/ | /golv-u/ |
|---|---|---|
| Vowel Copy | vóróń-u | golov-u |
| Accent Insertion | ------- | gólov-u |

The form /vóróń-u/ reduces to voránu by a general rule.[15]

Thus, the order of the rules must have been Vowel Copy followed by Accent Insertion.[16] And this order is exactly what would be predicted by a theory claiming that rules which refer to the nth syllable of a word typically apply only after the surface syllabic structure has been determined. Note, on the other hand, that the concepts of feeding and bleeding do not apply here, since the rule of accent insertion applies whether it is ordered before or after Vowel Copy. A theory which characterizes expected orders in terms of these concepts would predict that in such cases either order is to be equally expected. Such a claim strikes us as highly suspecious.

In conclusion, we hope to have established the following points. First, in cases where a rule A potentially bleeds another rule B by altering structures so that they no longer meet the contextual conditions of B, a bleeding order seems, in the range of cases we have examined, to be the expected situation. Secondly, if this is correct, then the principle of maximal application will have to be restricted in scope to accomodate such cases.

Needless to say, at this point a number of questions arise. Can one maintain that a bleeding order is always expected in situations where rule A potentially bleeds rule B in such a fashion? Notice that all of the examples we have discussed involve rules in the A and B position of a particular type: the former are rules of epenthesis, copying, and metathesis -- rules which affect syllabic structure; while the rules in the B position are rules which crucially refer to syllabic structure. In such situations will bleeding orders be expected if both rules are rules affecting syllable structure? If both refer to syllable structure in their environments? Or is it proper to view expected orders in terms of the notions feeding and bleeding at all?

The generalization that seems to emerge from the examples discussed above is that rules of assimilation, neutralization, etc., tend to be predictably ordered to apply to "surface" rather than "abstract" syllable structure. This would appear to indicate that one can make some guess as to the

position of a rule in the ordering on the basis of the formal properties of the rule itself. That is, such rules tend to apply after both rules of epenthesis and deletion, regardless of whether the latter feed or bleed them.

However, when one begins to examine this "generalization" a number of difficulties immediately spring to mind. To cite just one example, many languages have the following two rules in their grammars: a rule palatalizing a consonant before i, and a rule of apocope. Given the claim that bleeding orders are expected between an assimilation rule and a rule affecting syllable structure, we would predict that the apocope rule should precede, and, hence, bleed the palatalization rule. Yet a cursory inspection of languages possessing these two rules indicates that a non-bleeding order is typical. Perhaps one might suggest that the non-bleeding order is preferred because the i which drops by apocope leaves a "trace" on the preceding consonant. We have not as yet examined the matter sufficiently to be able to determine if this suggestion is at all viable.

In any case, it is apparent that many more factors will have to be taken into account, before we can begin to make precise the notions of marked and unmarked rule orderings.

Footnotes

1. See Kiparsky (1968).

2. ibid., p. 200.

3. See Kenstowicz (1971).

4. See Anderson (1969) for a discussion of many such examples.

5. In Standard Finnish derived ee remains, while in many dialects it diphthongizes to ie, indicating that these dialects have shifted the rules into a feeding order. See Kiparsky (1968).

6. See Kiparsky (1968).

7. See Newman (1944).

8. Underlying long high vowels lower to e: and o:. In addition, vowels harmonize with the initial stem vowel in such a way that high vowels round and back if the initial vowel is u and low vowels round if the initial vowel is o. For details, see Kisseberth (1970).

9. See Swadesh and Voegelin (1939). We are indebted to Charles Pyle for bringing this example to our attention.

10. See Jacobsen (1964).

11. See Barker (1964).

12. See Sapir (1922).

13. See Pyle (1970).

14. The case suffix, a lax diffuse vowel, drops out by another rule.

15. See Halle (1971).

16. This appears to be a genuine case of rule insertion, i.e. the addition of a rule to a grammar in position before another, chronologically earlier rule. For discussion, see King (1970). Another, quite recent, rule has been inserted before Accent Insertion. This rule yields the contrast between ô (a tense, close vowel like in French beau) and o (an open vowel similar to that of English bought) in some southern Russian dialects. The open o results from basic /o/'s which receive accent via the Accent Insertion rule. Basically accented /o/ is realized as ô. Hence, a rule taking /o/ to ô must have been inserted in these dialects before the ancient rule of Accent Insertion.

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# SOME PROBLEMS WITH i-INSERTION IN PĀLI

by

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0.1 In Pāli there are several rules of i-insertion. The most general and regular of these is the following:

$$(1) \quad \emptyset \rightarrow [i] \; / \; \left\{ \begin{matrix} [\bar{V}C] \\ [VCC] \end{matrix} \right\} \text{------} + \; C$$

This rule accounts for forms such as:

tappita / tapp + ta/ past passive participle of tapp- 'satiate'

sāsita / sās + ta/ past passive participle of sās- 'advise'

rūhita /rūh + ta/ past passive participle of rūh- 'ascend'

tappiya /tapp + ya/ gerund of tapp-

0.2 Pāli represents an early stage of middle Indic. At this stage of the language, i-insertion is in the process of spreading. In some contexts where it exists to a limited extent in Sanskrit, it is found quite regularly in Pāli, and in other contexts where it doesn't exist at all in Sanskrit, Pāli has innovated and the rule is in the process of spreading.

The above rule is the most regular rule of i-insertion in Sanskrit. However, in Pāli i-insertion has become even more regular and more generalized. As a consequence, this rule overlaps with certain other rules of i-insertion,e.g.

$$\emptyset \rightarrow [i] \;/\; C \text{ ----- } + \begin{bmatrix} C \\ +\text{ ant.} \\ +\text{ cor.} \end{bmatrix}$$

This rule accounts for forms such as:

patita /pat + ta/ past passive participle of
pat- 'fly, fall'

japita /jap + ta/ past passive participle of
jap- ' whisper'

0.3 However, because of the stage of development of i-insertion which Pāli represents, it is inevitable that this rule is in conflict with other rules involving consonant clusters. Thus, in addition to i-insertion there are rules assimilating consonants, producing geminates. The process is straightforward and easy to state, and the consonants can be grouped in terms of resistence to assimilation: obstruents, nasals, l,v,y,r. That is, a v assimilates to an l, to a nasal, to a sibilant, and to an obstruent; nasals assimilate to sibilants and obstruents; a sibilant assimilates only to an obstruent, etc. When two consonants of the same class meet, the first assimilates to the second, e.g. nm → mm; bd → dd.

This works only for stops, however; liquids and semivowels assimilate in the order given above, e.g. vy → vv. When a dental obstruent and a y come together, geminate palatals are produced: dy → jj; dhy → jjh; ty → cc; thy → cch. ( The aspirates first become geminate aspirates (e.g. jhjh), which are then simplified).

Because of these various consonant assimilations basic root structure is often destroyed when a suffix or an ending is added to a root. For example, if the past participle suffix -ta is added to a root such as pad, the result is patta: d and t both being obstruents, the first (d) assimilates to the second (t), yielding tt. The assimilation has destroyed root structure and made the participle patta identical to any other participle which would be formed from a root whose first two segments are pa and whose third segment is an obstruent ( e.g. patta < pat; patta < pac, etc.). i-insertion eliminates these problems; the participle of pad is padita, etc.

0.4 One of the most interesting and problematic areas in the development of i-insertion involves its behavior before y ( providing a morpheme boundary intervenes). Since there is a gerund suffix -ya, this category will be used to illustrate most of the problems involved. Concerning i-insertion before y, the following points are relevant:

(1) Before y, i-insertion takes place in general only if a heavy syllable ( V̄C, VCC) precedes the y:

tappiya, but gamma < /gam + ya/

(2) i-insertion does not take place between geminate palatals and y:

pajja /pajj + ya/ gerund of pajj- 'get into'

vijjha /vijjh + ya/ gerund of vijjh- 'pierce'

(3) i-insertion does, however, take place between r and y:

(2) $\emptyset \rightarrow$ [i] / [r] ------ + [y]

ariya /ar + ya/ 'Aryan'

(4) One of the main functions of i-insertion is to preserve root structure.

0.5 Classical Sanskrit has no rule of i-insertion before y, even if a heavy syllable precedes:

tarjya gerund of tarj- 'threaten'

āpya gerund of āp 'obtain'

cakṣya gerund of cākṣ 'see'

carya gerund of car 'move'

It is clear, then, that i-insertion following a heavy syllable (rule (1) ) and between r and y ( rule (2) ) are both rules which have been added to the grammar of Pāli.

1.1 The first question worthy of consideration is why i-insertion came to apply between r and y when it does not apply between any other single consonant and y.[1] That the

sequence ry originally underwent assimilation in Pāli rather than i-insertion can be seen from forms such as ayya, ariya (Skt. arya); niyyāma ( Skt. niryāma); udīyati (Skt. udīryate).[2] However, there are only a few such forms, and they usually alternate with forms with an i inserted. The later and usual forms are those with i.

1.2 A look at the way in which the assimilation rules work may give us a possible answer to the question of why i-insertion takes place between r and y. Remember that the order of assimilation is obstruents, sibilants, nasals, l, v, y, r. Thus, y assimilates to every other consonant in the language except r. This means that in a root which ends in any consonant except r, the final consonant and the y can assimilate without disturbing the root structure at all: /gam + ya/ → gamma, gerund of gam 'go'; /mas + ya/→ massa, gerund of mas 'touch'; /pac + ya/ → pacca gerund of pac 'cook', etc. The only place where the root structure would be obscured is where an r precedes the y, because r assimilates to every other consonant in the language, including y ( e.g. ayya < arya). The motivation for the loss of the rule of assimilation or r and y must then have been the attempt to preserve root structure. This is logical because the function of i-insertion generally seems to be to preserve root structure. When the assimilation rule was lost, it was replaced by i-insertion, as the cluster ry is not permitted.[3]

The synchronic repercussions of the addition of i-insertion will be discussed below.

2.1 The next problem concerns points (1) and (2) in section 0.4. As stated above, Sanskrit had a rule of i-insertion following a heavy syllable in some contexts (in particular before a suffix or an ending with an initial dental), but there is no such rule in Sanskrit when y follows a heavy syllable. However, by generalizing the rule to include y, Pāli made it unnecessary to specify any particular consonants in the environment of the rule ( e.g. tappiya). Recall that the environment is stated simply as $\begin{matrix}[\bar{V}C] \\ /[VCC]\end{matrix}$ ------ + C . This is a very natural type of extension and represents a definite rule simplification.

2.2 Even though the rule of i-insertion following a heavy syllable was generalized to apply before y, we find that there are still some cases where consonant assimilation rather then i-insertion takes place in this environment. The following forms illustrate this:[4]

| gerund (Pāli) | 3 Sg. present (Pāli) | root (Skt.) |
|---|---|---|
| āpajja | āpajjati | pad 'get into' |
| khajja | khajjati | khād 'chew' |
| anuvijja | anuvijjati | vid 'know' |
| nibbijjha | nibbijjhati | vidh 'pierce' |

| | | |
|---|---|---|
| vivicca | viviccati | vit 'separate' |

but:

| | | |
|---|---|---|
| visajjiya | vissajjati | sarj 'set free' |
| gajjiya | gajjati | garj 'roar' |
| rundhiya | rundhati | rundh 'break' |
| vaṭṭiya | vaṭṭati | vart 'turn' |
| sāsiya | sāsati | sās 'advise' |
| tappiya | tappati | tarp 'satiate' |
| upāsiya | upāsati | ās 'sit' |

Such forms reveal that the only context in which a cluster CCy undergoes assimilation instead of i-insertion is when the consonants are palatals (aspirated or unaspirated). The reasons behind this irregular assimilation of three consonants will become clearer if we investigate several other developments within the verbal system.

2.3 Besides the gerund suffix -ya which we have been discussing, there is in Sanskrit a present tense suffix -ya-. There are a couple of other present tense suffixes (-na-; -cch-), but -ya- is added to the largest number of verbs in the present tense. Many roots which have this present tense suffix -ya- end in dental obstruents. Because of consonant assimilation in Pāli, these types of presents came to have a new structure: The 3 Sg. present of the root pad in Sanskrit is padyate. This becomes Pāli pajjati ( dy > jj). The present stem of vit is Sanskrit vityate, Pāli viccati ( ty > cc). The present stem of Sanskrit vidh is vidhyate,

Pāli vijjhati ( dhy > jjh). Through this assimilation, the original suffix -ya- is obscured and a new present stem is created. ( Skt. present padya-, Pāli present stem pajja-). For various reasons which are of no concern to us here, the present stem began to be used in other verbal categories in addition to the tenses normally built on this stem. Originally the gerund, with the suffix -ya, was made from the bare root, not from the present stem. That is, if the present tense of a particular verb has a suffix in Sanskrit ( e.g. pad + ya + te; śak + no + ti),[5] the gerund will be formed from the simple root, without this suffix: pad + ya; sak + ya, where pad and śak are the roots and -ya is, of course, the gerund suffix. Thus, in Sanskrit, the 3 Sg. present of a root such as pad is padyate /pad + ya + te/ and the gerund is padya /pad + ya/. In Pāli, however, the 3 Sg. present becomes pajjati ( dy > jj). The gerund also becomes pajja.

At an early stage of the language, when the present stem was infiltrating into other verbal categories, but hadn't become completely generalized yet, a gerund such as pajja could be analyzed as being formed either from the new present stem pajj-, or from the original root pad. Since y assimilates to all other consonants ( except r ), the result will be the same in both cases. If the gerund suffix -ya is added to the present stem pajj-, assimilation and cluster simplification

will have to take place: /pajj + ya/ → /pajj + ya/ → pajja. If -ya is added to the root pad, assimilation will take place: /pad+ ya/ → pajja.

Thus, an ambiguity existed at one stage of the language as to whether the gerunds of some verbs were formed from the present stem or from the root. Notice however, that if the gerund is interpreted as being from the present stem (pajj-), this results in an assimilation of 3 consonants (jj + y). This is irregular, for, as we have seen, i-insertion is supposed to occur after a heavy syllable in Pāli. However, the fact that the gerund formation was ambiguous allowed the assimilation to remain, for there is no rule of i-insertion between a single consonant and y. The regular rule is assimilation (e.g. gamma, from /gam + ya/). Therefore, if the gerund pajja were interpreted as being from the original root pad, it would regularly be formed by the assimilation rule ( /pad + ya/ → pajja). The possibility that the ambiguous gerunds were regular formations from the root (rather than the present stem) caused the language to tolerate the otherwise irregular assimilation.

2.4 That this is a plausible reason for the preservation of an irregular assimilation rule can be verified by examining other categories where inherited forms were ambiguous as to whether they were formed from the root or from the present stem. These forms were not allowed to be formed through

irregular assimilation, but, rather have i-insertion. An example of this is the Skt. infinitive pattum, from the original root pad ( Pāli pajj-). This root has already been discussed. Recall that pajj- is formed from pad plus the present tense suffix -ya-. The formation of the inherited infinitive pattum is just as ambiguous as the formation of the inherited gerund pajja. pattum can be the result of /pad + tum/ → pattum or of /pajj + tum/ → /pajttum/ → /patttum/ → pattum. There is an important difference, however, between pattum and pajja. There is a regular rule of i-insertion in the environment / C ----- + $\begin{bmatrix} C \\ +ant. \\ +cor. \end{bmatrix}$ in Pāli. This means that even if the pre-Pāli infinitive pattum is interpreted as being formed from the original root pad rather than from the present stem pajj-, it is still irregularly formed, because i-insertion is the regular rule between a consonant and a morpheme boundary plus a dental. Thus, the attested infinitive in Pāli is pajjitum, not pattum*.

2.5 In later stages of Pāli, many verbs generalized the present stem completely. The resulting lack of alternation automatically made the present stem the new (underlying) root. That is, if the original root no longer remains anywhere, the present stem is interpreted as being the new root. For example, if pajj- were to be used as the stem from which all verbal forms are built, it would be felt to the root, since

now there would no longer be any alternations of the type pajj- ∿ pad.

Some verbs never generalized the present stem completely, so that the original root is still available. Other verbs, however did. Even though for these verbs no ambiguity exists any longer in the attested stages of Pāli because of complete generalization of the present stem, the gerund is still formed through assimilation of the geminate palatals and y, rather than through i-insertion. For example, the Pāli root vijjh- is original (Skt.) vidh. The present stem vijjh- (from Skt. vidh + ya) has been completely generalized in Pāli, but the gerund is still vijjha, not vijjhiya*. The fact that ambiguity once existed and still exists in some roots with this structure, apparently allowed assimilation to apply generally to the sequence CC+y, where the consonants are palatals. The result is a phonologically predictable exception to i-insertion rather than a few idiosyncratic exceptions.[6]

2.6 The question should now be raised as to why other roots which end in final geminates in Pāli have i-insertion before y rather than assimilation, as we find with final palatals. From the forms given in section 2.2, we can see that Pāli roots such as tapp- and vatt- end in geminates just as vijjh- and pajj-. There is one important difference, however: tapp- and vatt- are from the Sanskrit roots tarp and vart. Since

r assimilates to all other consonants, this causes the roots in Pāli to end in geminates. Notice that in roots such as this, there could never have been an ambiguity as to whether the gerund was formed from a root with a single final consonant or from a present stem with final geminates, because the root itself ends in geminates: tapp-, etc,due to assimilation within the root: Skt. tarp, Pāli tapp-. Therefore, when the rule of i-insertion between a heavy syllable and y was added to the grammar of Pāli, roots such as tapp-, which unambiguously end in 2 consonants, automatically underwent this added rule of i-insertion. This is apparently also the explanation for the behavior of the forms sajjiya and gajjiya (from the Skt. roots sarj and garj). For the jj of these forms is historically derived from a cluster rj (by assimilation within the root) and therefore does not alternate with a single stop. That is, at the time that i-insertion in the gerunds got fixed in the language, the jj of sajj- and gajj- unambiguously formed part of the (underlying) root.

2.7 There are a few roots which in Sanskrit end in consonants other than dental obstruents and which have the suffix -ya- in the present tense: Skt. tāmyati, Pāli tammati 'faint'; Skt. dīpyati, Pāli dippati 'shine'; Skt. divyati, Pāli dibbati 'play'.[7] Even though the formation of the gerunds from these roots is ambiguous, just as it is from roots in final

palatals, these roots in final non-palatal consonants form their gerunds with i-insertion. The reason for this is fairly clear. There are relatively few roots which both end in consonants other than dentals and had in Sanskrit the present tense suffix -ya-. This means that in Pāli there would be perhaps one isolated example of a root in final -pp, one in final mm, one in final vv, etc. which would have to be marked as exceptions to i-insertion before y as a result of having had ambiguous gerund formation, at some stage of the language at least. But except for the palatals, there is no genuine class of root-final geminate consonants which has been created as a result of assimilation.

2.8 As a result of the processes discussed above, gerunds ending in palatal plus a (-jja, -cca, -jjha , -ccha) can come from several sources: roots which unambiguously end in a dental, such as pat-: pacca; roots which end in a dental and have a present stem in a palatal geminate( which may be about to be reanalyzed as the root), such as pad- : present stem pajja- : gerund pajja; roots ending in velar or palatal, such as pac- : pacca. Thus, all roots in final palatals form their gerunds through assimilation, even when the root ends in geminate palatals, creating a heavy syllable, and, of course, the environment for i-insertion.

2.9 The expected development at a later stage of Indic would be for i-insertion(rather than assimilation) to begin

to apply in the gerunds of those roots which in Pāli now end in geminate palatals and which are no longer ambiguous; ( that is, in those roots which were ambiguous at one time, but which later have reanalyzed the present stem as the (underlying) root. Eventually we would expect that the present stem would be generalized into all categories in all verbs. At that point, no such ambiguity would exist at all any longer in the formation of gerunds. At such a stage, i-insertion will probably oust completely the assimilation of geminate palatals and y. Verification of this must await further investigation.

3.1 The next part of this paper is devoted to a discussion of some synchronic issues which historical developments such as the ones just discussed bring to light.

3.2 The addition of the rule of i-insertion between r and y is interesting historically because we can see plausible motivation for its addition in this context but in no other similar contexts (i.e. between any other single consonant and y). Synchronically, its effects are relatively harmless. It caused an extra rule of i-insertion to be in the grammar, which could be viewed as a complication. However, the clarity which it added in terms of preserving root structure would seem to me to outweigh the fact that the grammar is burdened with an extra rule of i-insertion.[8]

3.3 The effects of the assimilation of geminate palatals and y are much more complicated. It is with the manner of characterization of this irregular assimilation that the rest of this paper is concerned.

As we have seen, rule (1), i-insertion following a heavy syllable, does not apply if the environment consists of geminate palatals followed by y. Instead, assimilation of the palatals and y takes place, followed by simplification of the 3 consonants: jjy → jjj → jj.

3.4 We are now faced with the problem of how to characterize this exceptionality. Perhaps the most logical first consideration would be rule ordering. If the rule of assimilation of palatal consonants with y could be ordered to apply before i-insertion, this would eliminate a great deal of the difficulty. The few forms such as gajjiya would be exceptions to the assimilation rule, and because they are exceptions, they will then undergo the i-insertion rule.

3.5 Even though this solution is very simple and accounts for the facts, it has extremely serious shortcomings. First of all, the assimilation rule for palatal geminates plus y would have to be separate from the regular assimilation which applies to all other consonants (except r). This would be counterintuitive in so far as y does assimilate to single palatals, just as it assimilates to all other consonants (except r). If, on the other hand, i-insertion applies first,

the roots with geminate palatals will have to be marked as exceptions.[9] The roots with palatals could then be included in the rule of assimilation of other consonants with y:

3.6 It is possible that we could justify ordering the palatal plus y assimilation rule before the i-insertion rule by claiming that since it involves assimilation of 3 consonants, this part of the rule should be separated from the other assimilation rules, i.e., we could make the assimilation of geminate palatals with y a separate rule. Even if this is true, however, the rule ordering solution still presents serious difficulties. In fact, it makes several incorrect claims about i-insertion at this stage of the language.

Ordering the rule of assimilation of palatals with y before i-insertion makes the following claims:

(1) It claims that this assimilation rule is felt to be a regular rule of the language, in no way exceptional. Forms which undergo it have no further connection or relation to the rule of i-insertion which follows it.

(2) It claims that forms like gajjiya which undergo i-insertion rather than assimilation do so as a result of their being exceptions to the assimilation rule.

These claims seem to me to be false. i-insertion is in the process of pervading the entire language. It has become

so wide spread that even in contexts where assimilation is still the most regular rule (such as after a single consonant followed by a morpheme boundary plus y), i-insertion is found sporadically. Thus, even though a gerund such as labhiya has to be characterized formally at this stage as an exception to assimilation of a single consonant plus y, it seems unlikely that a speaker would have felt it to be a real exception. Rather, it has fallen under the generally most productive of the 2 rules (i-insertion, as opposed to assimilation). Thus, ordering of assimilation before i-insertion in effect claims that the former takes precedence over the latter, while the opposite is the actual tendency. If assimilation took precedence over i-insertion, sajjiya and gajjiya would probably have ceased being formed by i-insertion and we would at least find alternate forms with assimilation, for, as we have seen, assimilation is the regular rule for palatals plus y.

3.7 Taking these facts into consideration, it seems fairly clear that the assimilation of geminate palatals with y has to be considered an exception to i-insertion (rule (1) ). This is especially true since this rule of i-insertion is the most regular of the various rules of i-insertion in the language.

If the rules of i-insertion apply before the assimilation rules, the latter can be considered to be "clean-up"rules.

That is, they take care of all of the forms which are either exceptions to one of the i-insertion rules, or are contexts in which i-insertion hasn't yet spread. This ordering allows us to make a definite connection between i-insertion and its failure to apply between geminate palatals and y. It also allows us to combine the assimilation of geminate palatals and y with the assimilation of a single palatal and y and with other consonants and y.

3.8 Gerunds such as gajjiya, which undergo i-insertion, do so historically because they were never ambiguous as to their formation (cf. above). However, since there are gerunds which were once ambiguous as to their formation, but which are no longer ambiguous because of complete generalization of the present stem, a root such as gajj- (with original double final consonants) is no different synchronically from a root such as pajj- (which was originally pad). At this stage, then, there is no way of telling that the root gajj- has the gerund gajjiya because it was originally unambiguous, whereas the root pajj- has the gerund pajja because it was originally ambiguous. Hence, synchronically, sajjiya and gajjiya must be interpreted as having i-insertion for the same reason as labhiya has i-insertion. In other words, they are simply forms which are undergoing the most current and productive rule, even though they have environments where i-insertion hasn't really made its way yet.[10]

Thus, it is very doubtful that forms like gajjiya are felt to undergo i-insertion as a result of being exceptions to an assimilation rule. The latter would claim further that i-insertion is acting as a "clean-up"rule for the assimilation rule. It should be obvious by now that this is not the case. Synchronically, gajjiya and sajjiya seem to indicate that i-insertion has begun to penetrate into yet another environment.

3.9 If i-insertion cannot plausibly be ordered after assimilation of palatals with y, then the forms which undergo this assimilation must be characterized as exceptions to i-insertion. This can be done by means of a readjustment rule. This manner of characterization is not without problems either, however. Exceptions to rules of epenthesis create problems because there is no segment actually present in the morpheme which can be marked as exceptional in failing to undergo the rule. In The Sound Pattern of English, Chomsky and Halle suggest that exceptions to epenthesis may be evidence for marking contexts as exceptions to rules. However, they have no compelling evidence and therefore discuss the problem very briefly. Coats (1970) has proposed that each lexical item be marked either + or - the environment of a rule. Thus, any segment which is marked as -environment of a rule may not function as part of the

environment of that rule. This seems to be a much more reasonable and plausible way to handle exceptions to epenthesis, because such morphemes do not have to be marked as exceptions to a rule when none of their segments fails to undergo that rule; Rather, the morphemes can be marked as exceptions to the environment of the rule, expressing the fact that they fail to condition the rule.

4.1 The exceptions to i-insertion in Pāli present one further problem. The root pajj-, for example, cannot simply be marked as -the environment for the i-insertion rule. The i-insertion rule specifies no specific consonants, so that if pajj- is marked as -the i-insertion rule, it will also fail to condition the rule when the consonant following the morpheme boundary is one other than y. This is, of course, incorrect. When a suffix beginning with a consonant other than y is added to a root like pajj-, i-insertion occurs: /pajj + ta/ → pajjita; /pajj + tvā/ → pajjitvā, etc. The readjustment rule will have to state an environment; it will have to state that roots in final geminate palatals will fail to condition i-insertion if they are followed by a morpheme boundary plus y. Notice that roots such as gajj-, whose gerunds do have i-insertion, will be exceptions to the readjustment rule. This makes a more correct claim about the nature of i-insertion in Pāli. The claim

is now that the gerunds in which geminate palatals assimilate with y are exceptions to i-insertion, and that gerunds like gajjiya are exceptions to the exception. By being exceptions to the readjustment rule, they then undergo the more productive and general rule of i-insertion.

FOOTNOTES

(1) Recall that before y, i-insertion takes place after a heavy syllable only.

(2) Pāli udīyati is from /udīyyati/ with the consonant cluster simplified because of the preceding long vowel.

(3) Unlike consonant clusters are in general not tolerated.

(4) I have not given any underlying forms here because as will become clear later, there is ambiguity of formation of the gerunds. To state this here would cause unnecessary confusion.

(5) 3 Sg. presents of pad and śak respectively, where -ya- and -no- are present tense suffixes.

(6) This problem will be further discussed below.

(7) vv → bb / V---- V

(8) Kenstowicz (1970) discussed a similar situation in Lithuanian where a rule changing accent seems to have no other motivation than to prevent another rule from applying. This prevention serves to preserve the underlying form of roots from being obscured.

(9) Problems in doing this will be discussed below.

(10) Between a single consonant and y and between geminate palatals and y.

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# A STRESS MESS

by

Susan F. Schmerling

One of the more important claims made in The Sound Pattern of English is that stress is predictable in English.[1] One of the examples of the predictive power of the grammatical model used by Chomsky and Halle is the application of the Compound and Nuclear Stress Rules (henceforth CR and NSR), which account for the difference in stress between the compound bláckbòard and the noun phrase blâck bóard; the former rule applies to a surface structure $[_{N}\#[_{A}\#black\#]_{A}[_{N}\#board\#]_{N}\#]_{N}$, the latter to $[_{NP}\#[_{A}\#black\#]_{A}[_{N}\#board\#]_{N}\#]_{NP}$.[2] Unfortunately, Chomsky and Halle give little consideration to the implications of their brief treatment and fail to answer - or even pose - at least three crucial questions: 1) how are the surface structures which are input to these rules attained? 2) how are exceptions to be accounted for?[3] and 3) what is a compound anyway?

An answer to the third question is implied in the respective surface structures Chomsky and Halle assign the two expressions above. At this point, however, it would be unjustified to use such a putative syntactic difference as the criterion for whether a given nominal expression is or is not a compound; one would first like to find an independent criterion and then attempt to find syntactic justification for the proposed surface structures

so that the problem of the correct structure would become an empirical question, given independently motivated assumptions about the grammar of English. Unfortunately Chomsky and Halle provide neither a criterion for compoundness nor justification for the surface structures they assign to compounds. Since they do admit the existence of what they refer to as exceptions to CR, it is clear that their criterion for compoundness is not a phonological one.

An answer to the third question is obviously necessary before one can ask - let alone answer - the second, for one must first know that some nominal expression which fails to undergo CR is in fact a compound before one can characterize it as an exception. Similarly, one must have some principled method of deriving the desired surface structures before one can determine how exceptional expressions are to be handled: is the exceptional character of a given expression an idiosyncratic property or does it derive from some general principle?

I have no answer to any of these questions, but I feel that it is imperative to bring them up. It is simply <u>not</u> the case that there are only a few isolated exceptions to CR; there are a great many, and many of the exceptional expressions seem to be formed by productive processes. Consider, for example, the following noun-noun expressions with nuclear stress:[4]

<u>âpple píe</u>

<u>India ínk</u>

machîne translátion

kîtchen sínk

Vîetnam wár[5]

câmpus unrést

sîtuation éthics

ârmchair diplómacy

Câesar sálad

ânimal húsbandry

dîll píckle

cârdboard bóx

There are also many adjective-noun expressions with nuclear stress which differ from NP like blâck bóard in that they cannot be paraphrased by the analogue of board which is black and hence, presumably, cannot be derived in the same manner as the latter:[6]

Amêrican hístory

Gêrman grámmar

Énglish hórn

acôustic phonétics

nûclear phýsics

cîvil enginéering

cîvil wár

cîvil ríghts

lîberal árts

âcademic fréedom

constitûtional authórity

gêneral wélfare

domêstic scíence

sulfûric ácid

hûman náture

cûltural exchánge

syntâctic cýcle

cêrvical cáncer

For purposes of discussion, let us refer to the first element in each expression as the attributive and to the second as the head. Now, if it could be shown that some motivated syntactic derivation(s) produced the expressions listed above by ultimately sister-adjoining the attributive to the head, while other rules produced the expressions undergoing CR by Chomsky-adjoining the attributive to the head, the Chomsky-Halle analysis could be saved, since the desired surface structures would thus be attained. It is immediately obvious that such an approach will run into serious difficulties. In many cases structures which would underlie the first type of expression would underlie corresponding examples of the second type. Compare the following:[7]

| Nuclear stress | Compound stress |
|---|---|
| Crimêan Wár | Bóer Wàr |
| Avogâdro's número | Párkinson's disèase |
| Stânley Stéamer | Géiger còunter |
| âpple píe | ápplesàuce |
| dîll píckle | mústard pìckle |

It thus looks at this point as if we are faced with a series

of parallel rules which differ only in the type of adjunction involved: sister-adjunction in the cases with nuclear stress, and Chomsky-adjunction in the cases with compound stress. Apparently these rules would be lexically governed, a point to which we shall return later. This is indeed a messy situation (which may of course prove to be necessary); however, before accepting the assumption that differences in surface structure are responsible for the differences in stress, we ought to look into the situation more closely.[8]

In some nominal expressions, it seems to be the case that choice of compound- or nuclear stress is governed, in some way, by the choice of head, as in the following examples:

Compound stress:

-doctor: éyedòctor, fóotdòctor, hórse-dòctor, bâby-doctor etc.[9]

-smith: blácksmìth, góldsmìth, cóppersmìth, sílversmìth

other names of occupations

-bread: whíte brèad, rýe brèad, córnbrèad, spóon-brèad, ráisinbrèad etc.[10]

-bone: báckbòne, wrístbòne, légbòne, wíshbòne etc.

names of streets ending in street

Nuclear stress

-pie: âpple píe, chêrry píe, blâck-bottom píe, Côttleston píe etc.

-pudding: chôcolate púdding, rîce púdding, Yôrkshire púdding etc.

other foods: -ice cream, -sherbet, -soup (in my dialect), -stew, -jam etc.

-psychology: chîld psychólogy, sôcial psychólogy, indûstrial psychólogy, reverse psychólogy etc.

-history: Amêrican hístory, âncient hístory, ârt hístory, nâtural hístory etc.

names of streets ending in avenue, boulevard, road, lane, place, drive, circle, throughway etc.

In other cases stress placement seems to be governed by the choice of attributive. All examples with right seem to take nuclear stress: rîght árm, rîght fóot, rîght wíng, rîght fíeld, Rîght Bánk. The same is true for left, of course. Also north(ern): Nôrth Dakóta, Nôrth Carolína, Nôrth Vietnám, nôrth fórty, Nôrthern Líghts, nôrthern hémisphere; the same is true of the other directions. (Notice that these are locative expressions, not derivable by WHIZ deletion and adjective preposing; one cannot say *the arm which is right etc.) Charles Kisseberth has pointed out to me that blood appears to be an attributive requiring compound stress: blóod bàth, blóod mòney, blóod bròther, blóodbànk etc.

There are also subregularities of this type. Thus compounds with school always have compound stress when the type of school is indicated: grámmar schòol, hígh schòol, tráde schòol, médical schòol etc. When the name of the school is indicated, nuclear stress results: Wâshington Schóol. This cannot be predicted by the fact that it contains a proper name; cf. Montessóri schòol. Nor can it be predicted by the fact that the whole expression is a proper name; surely Stâte Strèet is every bit as much a proper

name (although, admittedly, most proper names do indeed take nuclear stress).

Another type of regularity shows up in cases like cêrvical cáncer, abdôminal cáncer beside lúng càncer, bráin cáncer. If the attributive is superficially an adjective, nuclear stress obtains; if it is a noun we get compound stress. Compare also:

| Nuclear stress | Compound stress |
|---|---|
| abdôminal súrgery | héart sùrgery |
| cerêbral hémorrhage | bráin hèmorrhage |
| venêreal diséase | hoof-and-móuth disèase |
| nûclear attáck | mórtar attàck |
| biolôgical scíence | fóod scìence |
| histôrical nóvel | wár nòvel |
| internâtional láw | divórce làw |
| pêriodic táble | lóg tàble |
| nûclear stréss | cómpound strèss |

In these cases there seems to be an etymological correlation: the adjectives (cases with nuclear stress) are of Latin or Romance origin, while the nouns (cases with compound stress) are frequently of Germanic origin. This is probably not an accident: the nuclear-stress cases are typical of Romance syntax (ignoring the word-order) while the other cases follow a Germanic pattern. (It is interesting, in fact, to compare the facts in German, which, for the most part, exhibits the same compound- and nuclear stress patterns as English. Most expressions of the type considered in this

paper have compound stress in German. Compare, for example, English expêrimental phýsics, with nuclear stress, and German Experimentálphysìk, with compound stress.)

In other cases it is neither the attributive nor the head which governs stress placement but the combination. Thus in my own speech I have lêttuce sálad, frûit sálad, chîcken sálad, Câesar sálad with nuclear stress but potáto sàlad with compound stress. I have grêen béan, Lîma béan with nuclear stress but stríngbèan, návy bèan with compound stress; dîll píckle with nuclear stress but mústard pìckle with compound stress.

Can rule features possibly be made to account for these facts? Suppose we have syntactic rules of compound-formation involving both Chomsky- and sister-adjunction, as discussed above. It is fairly easy to see that rule features will not possibly be able to account for all the cases unless the notion of rule feature is to be expanded to a point where it is practically vacuous. We have noted that in some cases stress placement is governed by the choice of attributive, in others by the choice of head, in others by the combination. This means that in some cases rule features must be stated on the attributive, in others on the head; in the last category the rule features would have to be context-sensitive, whether stated on the attributive or the head. The context to which they would be sensitive would have to be a list of lexical items. It could not be a feature shared by these lexical items, as these could occur in compounds exhibiting both kinds

of stress. To give an example from my dialect, potáto sàlad: salad could not be marked as undergoing either the Chomsky-adjoining or the sister-adjoining rule since which rule it undergoes is a function of the choice of attributive: I have potáto sàlad with compound stress but frûit sálad with nuclear stress. Potato cannot be marked as undergoing either rule since I also have potâto sóup with nuclear stress. A context-sensitive rule feature on salad would have to mention potato, not a feature which potato shares with other lexical items. A context-sensitive feature on potato would have to mention salad, not a feature which salad shares with other lexical items.

An analogous problem occurs if we posit stress-assignment rules sensitive not to surface structure but to (phonological) rule features stated on lexical items.

Is there a way out of this mess? Perhaps the first step out is to recognize the situation for what it is: a mess. It is going to be futile to try to formulate a few nice, simple rules to capture generalizations which don't exist. Some generalizations do exist, of course, and should be captured. It does seem to be the case that in some instances stress assignment is governed by the choice of head or attributive, in others by syntactic characteristics (whether the attributive has the superficial form of an adjective or a noun). There ought to be rules that capture these generalizations. In other cases stress assignment is an idiosyncratic property of individual compounds and ought to be indicated in the

lexicon as such. The fact that stress placement is sometimes predictable should not make us try to predict it always. To take an analogy from segmental phonology: the voicing of the plural morpheme of English nouns is predictable according to the voicing of the preceding segment. Yet in other cases we cannot predict whether a final s will be voiced or voiceless. This does not seem to bother anybody. We simply take it for granted that in some cases the voicing of word-final s is predictable and that in other cases it is not. We may disagree as to the nature of underlying representations and rules involved but not on the generalization we want the grammar of English to capture.

This brings us back to the question of predictability. One might argue for the analysis suggested by Chomsky and Halle, whereby a special boundary would block the application of CR in the exceptional cases. This way, one could claim, stress assignment is still predictable. Note, however, that making use of such an ad-hoc boundary would be notationally equivalent to saying that stress is not predictable in the exceptional cases, since, as we have seen, there is no general principle by which such a boundary could be predicted. It is important, I feel, to exclude such analyses, if the notion of predictability is not to be a vacuous one. One often hears statements to the effect that generative grammarians have shown that English stress is predictable, contrary to the claims of structuralists. But notice what such a statement means. It does not mean that structuralists were less observant than gene-

rative grammarians; it indicates, rather, a difference in the definition of predictability. To the structuralist, English stress is not predictable, since it is not uniquely determined by phonetic representation (thus contrasting with, say, Latin stress). Thus when the structuralist states that stress is or is not predictable in a given language he is making an empirically falsifiable, and therefore, interesting claim about that language. To the generative grammarian, this definition of predictability is an uninsightful one, for by looking at stress in this way we are unable to distinguish cases where stress assignment is truly idiosyncratic from those where it follows from general principles which happen to involve more abstract representations. However, in order to make his claims as interesting as the structuralist's, the generative grammarian must define 'predictable' just as rigorously. Otherwise the statement 'Stress assignment in language X is predictable' is of no more interest than 'Look how I can fudge stress assignment in language X.'

In conclusion, then, this paper purports to have shown that choice of compound- or nuclear stress for English nominal expressions cannot always be a function of what rules were used in formation of the expression. At least some compounds must be listed in the lexicon along with an indication of their idiosyncratic stress properties. I do not mean to suggest here that in the latter case no syntactic rules have applied to the structures underlying these compounds. I am simply stating that in these

cases stress placement cannot be predicted on the basis of what rules have applied.

## APPENDIX: COMPOUND ADJECTIVES WITH NUCLEAR STRESS

As in the case of nominal expressions, there are compound adjectives which do not undergo CR in post-copular position, such as the following:

spêcies-specífic

côntext-sénsitive

brând néw

îce cóld

âd hóc

hârd-héarted

ôpen-mínded

âbsent-mínded

ûnderdevéloped

In attributive position, however, it appears to be the case that CR has applied, as in brând nèw cár, îce còld béer, âd hòc rule, âbsent-mìnded profèssor etc. This phenomenon also occurs in other cases of prenominal expressions (including many polysyllabic simple nouns and adjectives as shown in many of the examples in this paper) which, in isolation, have nuclear stress:

| | | |
|---|---|---|
| ûphíll | but | ûphìll fíght |
| Mônday mórning | | Mônday mòrning depréssion |
| ôver the cóunter | | ôver-the-còunter sále |
| rîght wíng | | rîght-wìng extrémist |

This phenomenon presents a serious problem for the principle of the phonological cycle as argued for by Chomsky and Halle. Note that on the cycle at which NSR and CR are first applicable, it is impossible to know whether these expressions are in prenominal position. One might suppose that on a later cycle some stress-adjustment rule might operate, but such a rule could not be formulated like the other stress rules, i.e. by assigning primary stress. There are probably several possible and equally unmotivated ways of getting around this problem, but I see no well-motivated solution at this time.

FOOTNOTES

[1]I wish to thank Charles Kisseberth for valuable comments on an earlier version of this paper.

[2]Pp. 16ff., 89-94. These rules also apply to other constituents: CR applies to N,A or V; NSR applies to others. In this paper I am principally concerned with nominal expressions; some compound adjectives are discussed in the appendix.

[3]Actually, Chomsky and Halle do touch on this question as follows (p. 156): 'The exceptions to the Compound Rule are of various sorts. There is considerable dialectal variation in connection with the placement of primary stress in items such as chocolate cake, apple pie, and many others. There are also widely maintained but syntactically unmotivated contrasts such as Fifth Avenue, with nuclear stress on the second element, versus Fífth Street, with compound stress on the first element. Furthermore, proper nouns (e.g. John Smíth, John Paul Jónes) and names with titles (President X, Senator Y, etc.) typically have the nuclear stress of phrases rather than the initial stress of compounds, as do such noun-noun constructions as stone flóor and iron bóx... The fact that a phrase is not subject to the Compound Rule might be formally indicated in various ways: for example, by a feature specification of the boundary between the constituents, in which case the rule can be limited to boundaries not containing this feature. This, obviously, does not solve the general problem, but serves only to eliminate it from the domain of phonology. The problem remains of determining under what syntactic conditions

this feature is or is not present. Alternatively, we might provide for an ad hoc deletion of the node N dominating such compounds. In fact, the general problem certainly belongs in part to syntax, in part to the readjustment component, rather than to phonology proper, and it can be clarified and resolved only by an investigation of the conditions, syntactic and other, under which the Compound Rule is applicable. For this reason, we will make no attempt to go more deeply into the question here. We have throughout been limiting ourselves arbitrarily to problems of phonological interpretation, and are making no attempt in the present study to investigate the processes by which the syntactic component of the grammar forms the surface structures that are phonetically interpreted by the rules we have been discussing here.'

One cannot, of course, fault Chomsky and Halle for not investigating everything; but since they have, in fact, investigated so little that is relevant here, one cannot help wondering how much justification there is for CR. At the very least, one would like some justification of the surface structures which are supposed to be the input to this rule.

[4]Examples are based on my own pronunciation. There seems to be quite a bit of variation between compound and nuclear stress with certain expressions. However, since these expressions with nuclear stress occur in all dialects, the problem is not affected by variation in some expressions.

[5]Note the shift in stress on Vietnam. This phenomenon occurs frequently in these expressions and is discussed further in the appendix.

[6]This is one conceivable criterion for compoundness, but it is not infallible. Examples like whíte màn and óld pèople are paraphrasable by man who is white, people who are old. Furthermore, there are no corresponding NP analogous to blăck bóard; whîte mán and ôld péople are possible only in contrastive contexts.

[7]For further examples, see Lees (1966), especially pp. 180-85.

[8]There are logically possible alternative analyses, of course, but they all look equally messy. For example, one might propose compound-formation rules within the lexicon, à la Jackendoff. This would simply transfer the problem to the lexicon. Or one might propose that the productive rules belong to syntax, while the unproductive ones belong to the lexicon. Unfortunately, there are both productive (cârdboard bóx, Frénch tèacher) and unproductive (lîberal árts, blăckbòard) types exhi-

biting both kinds of stress.

[9]This is probably a function of the rule(s) forming these expressions rather than having to do with doctor specifically. I do not believe that it is a fact of English grammar that we don't have e.g. bâby dóctor 'doctor who is a baby'. Note that probably any native speaker of English would know what bâby dóctor is supposed to mean. Similarly, speakers know that cárdboard bòx would denote a box to contain cardboard. These are just two examples showing that not all apparent exceptions to CR are in fact exceptional; some of them follow regular principles. Clearly the formation of English nominal expressions is more complicated than has previously been supposed.

[10]Exception (in my dialect, at least): blâck bréad. Is this really an exception, or is it just an accident that most examples with bread as head undergo CR?

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# CONSONANT GRADATION IN FINNISH

by

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Stops in Finnish are weakened in the environment of closed syllables by a rule of consonant gradation. How a stop will be affected by consonant gradation depends on the type of stop involved. If the stop is a geminate, then the stop is weakened to the corresponding non-geminate:

| | | | | |
|---|---|---|---|---|
| (1) | pp ~ p | piippu | ~ piipun[1] | 'pipe' |
| | | helppo | ~ helpon | 'easy' |
| | tt ~ t | hattu | ~ hatun | 'hat' |
| | | lantti | ~ lantin | 'coin' |
| | kk ~ k | paikka | ~ paikan | 'place' |
| | | kirkko | ~ kirkon | 'church' |

The occurrence of a liquid or nasal before the geminate stop will not alter the gradation of the stop.

On the other hand, the occurrence of a liquid or nasal before a single, non-geminate stop will affect gradation. For example, a single stop will be nasalized when preceded by a nasal:

| | | | | |
|---|---|---|---|---|
| (2) | mp ~ mm | lempe | ~ lemmen | 'love' |
| | nt ~ nn | ranta | ~ rannan | 'beach' |
| | ŋk ~ ŋŋ | saŋko | ~ saŋŋon | 'bucket' |

Except when preceded by a nasal, the labial stop p is weakened to v:

| | | | | | |
|---|---|---|---|---|---|
| (3) | p ~ v | halpa | ~ | halvan | 'cheap' |
| | | arpa | ~ | arvan | 'chance' |
| | | tapa | ~ | tavan | 'custom' |

The dental stop t will become a liquid when preceded by a liquid:

| | | | | | |
|---|---|---|---|---|---|
| (4) | lt ~ ll | silta | ~ | sillan | 'bridge' |
| | rt ~ rr | virta | ~ | virran | 'stream' |

Otherwise, t is weakened to d:

| | | | | | |
|---|---|---|---|---|---|
| (5) | t ~ d | tahto | ~ | tahdon | 'will' |
| | | pato | ~ | padon | dam' |

When preceded by a liquid or h and followed by the vowel e, the velar stop k is weakened to the glide j:

| | | | | | |
|---|---|---|---|---|---|
| (6) | lke ~ lje | kulke | ~ | kuljen[2] | 'to go' |
| | rke ~ rje | kurke | ~ | kurjen | 'crane' |
| | hke ~ hje | puhketa | ~ | puhjetah[3] | 'to burst' |

In the environment of high, rounded vowels, k is gradated to v:

| | | | | | |
|---|---|---|---|---|---|
| (7) | uku ~ uvu | suku | ~ | suvun | 'kin' |
| | yky ~ yvy | kyky | ~ | kyvyn | 'ability' |

In all other environments, k is deleted:

| | | | | | |
|---|---|---|---|---|---|
| (8) | k ~ Ø | alku | ~ | alun | 'beginning' |
| | | pyrki | ~ | pyrin[4] | 'to strive' |
| | | uhka | ~ | uhan | 'threat' |
| | | sika | ~ | sian | 'pig' |

In some cases, a preceding h blocks the deletion of k; for example:

(9) hk ~ hk[5] sähkö sähkön 'electricity'

Gradation will not affect the stop if the stop is preceded by s or by a non-homorganic stop:

(10) sp ~ sp piispa ~ piispan 'bishop'

st ~ st posti ~ postin 'mail'

sk ~ sk hauska ~ hauskan 'fun'

tk ~ tk matka ~ matkan 'trip'

Gradation applies only once to a given stop:

piippu + n → piipun

Gradation does not reapply:

piipun → *piivun

In addition, gradation cannot apply to an initial stop:

piippu → *viippu

Let us first consider the gradation rule for the non-geminate stops. Superficially, we could write rules like p → v, t → d, and k → Ø to handle most of the cases. For example, p → v occurs unless p is preceded by a nasal. We could therefore write the following rule for the gradation of p:

$$p \rightarrow v \; / \; \begin{bmatrix} +son \\ -nasal \end{bmatrix} __ \; VC \; \begin{Bmatrix} C \\ \# \end{Bmatrix}$$

The feature for nasality [-nasal] must be specified because of case (2): p → m / m ___. Of course, we could order the

rule for nasal environment before this rule and thus eliminate the feature for nasality in that rule:

(1) $p \rightarrow v \; / \; [+son] ___ VC\{^{C}_{\#}$

With the other stops t and k, our gradation rule will not be as simple. For example, to handle case (4) we will need a rule like

$$t \rightarrow d \; / \; \begin{bmatrix} +son \\ -cons \end{bmatrix} ___ VC\{^{C}_{\#}$$

The feature [-cons] must be specified because of cases (2) and (4):

$t \rightarrow n \; / \; n ___$

$t \rightarrow l \; / \; l ___$

$t \rightarrow r \; / \; r ___$

But again, if we order the rule for liquid environment before this rule, as well as our rule for nasal environment, we will have

(2) $t \rightarrow d \; / \; [+son] ___ VC\{^{C}_{\#}$

But in order to naturally explain what happens with the velar stop, we cannot simply write

(3) $k \rightarrow \emptyset \; / \; [+son] ___ VC\{^{C}_{\#}$

because of cases (6) and (7). If k is preceded by either a liquid or h and followed by the vowel e, then $k \rightarrow j$ occurs. Hence, before $k \rightarrow \emptyset$ applies, we need the rule

$$(4)\quad k \rightarrow j \;/\; \begin{bmatrix} +\text{cont} \\ +\text{son} \\ -\text{syll} \end{bmatrix} ___ \; eC\begin{Bmatrix} C \\ \# \end{Bmatrix}$$

Similarly, in order to explain case (7), we need the rule

$$k \rightarrow v \;/\; \begin{bmatrix} +\text{syll} \\ +\text{high} \\ +\text{round} \end{bmatrix} ___ \begin{bmatrix} +\text{syll} \\ +\text{high} \\ +\text{round} \end{bmatrix} C\begin{Bmatrix} C \\ \# \end{Bmatrix}$$

There is evidence in Finnish that v is underlyingly the glide w.[6] Thus our rule will be

$$(5)\quad k \rightarrow w \;/\; \begin{bmatrix} +\text{syll} \\ +\text{high} \\ +\text{round} \end{bmatrix} ___ \begin{bmatrix} +\text{syll} \\ +\text{high} \\ +\text{round} \end{bmatrix} C\begin{Bmatrix} C \\ \# \end{Bmatrix}$$

A later rule w → v will apply in all environments.

The problem is that we need a natural explanation for these rules. In once case, the front vowel e appears to cause a palatalization of k into a front glide. In the other case, a round glide is produced in the environment of high rounded vowels. These glides are, of course, voiced and continuous. Another problem is that each of our rules (1)-(5) is a gradation rule. We have specified the environment for gradation in each rule. Instead, let us consider the possibility that there is a single gradation rule that will apply to a non-geminate stop in the environment

$$[+\text{son}] ___ VC\begin{Bmatrix} C \\ \# \end{Bmatrix}$$

and will change that stop to another segment. The problem is to determine what kind of segment the gradation rule will produce.

One possibility would be that the gradated segment is the voiced counterpart to the voiceless stop. This would give us a gradation rule of the form

$$\begin{bmatrix}-\text{cont}\\-\text{son}\end{bmatrix} \rightarrow [+\text{vcd}] \;/\; [+\text{son}] \;___\; \text{VC}\begin{Bmatrix}\text{C}\\\#\end{Bmatrix}$$

We could then postulate certain rules operating independently of the environment for gradation that would give us the correct output:

$$g \rightarrow j \;/\; \begin{bmatrix}+\text{cont}\\+\text{son}\\-\text{syll}\end{bmatrix} \;___\; e$$

$$g \rightarrow b \;/\; \begin{bmatrix}+\text{syll}\\+\text{high}\\+\text{round}\end{bmatrix} \;___\; \begin{bmatrix}+\text{syll}\\+\text{high}\\+\text{round}\end{bmatrix}$$

and then $g \rightarrow \emptyset$ would apply in all remaining environments. The voiced labial stop b would be later converted to w by another rule.

There are some problems with this rule for gradation. First, in any loan words that originally contained voiced stops, these stops are generally pronounced as voiceless stops in standard Finnish. Thus $b \rightarrow p$, $d \rightarrow t$, and $g \rightarrow k$ rather than d remaining unchanged and $b \rightarrow w$ and $g \rightarrow \emptyset$. The old Baltic word for 'people', gansa, became kansa in Finnish, not *ansa. The Swedish loan words for 'dozen' and 'ball' are tusina and pallo rather than *dusina and *wallo or *vallo. Secondly, if the gradation rule just makes voiced stops, then why wouldn't the palatalization environment of

rule (4) merely change a voiced velar stop to a voiced palatal stop. In fact, the changes k → j and k → w imply that the stop must somehow become continuous as well as voiced.

An obvious alternative is that the gradation rule does something in addition to voicing the stops. A more natural solution is to claim, in fact, that gradation changes the voiceless stop to its corresponding voiced fricative, which will be a continuous segment:

(1') p → β

(2') t → δ

(3') k → γ

or more formally,

$$\text{(A)} \begin{bmatrix}-\text{cont}\\-\text{son}\end{bmatrix} \rightarrow \begin{bmatrix}+\text{cont}\\+\text{vcd}\end{bmatrix} \;/\; [+\text{son}] ___ \text{VC}\begin{Bmatrix}\text{C}\\\#\end{Bmatrix}$$

This formulation explains the rules of velar palatalization and labialization more naturally. Our secondary rules will therefore be:

$$\text{(4')} \quad \gamma \rightarrow \text{j} \;/\; \begin{bmatrix}+\text{cont}\\+\text{son}\\-\text{syll}\end{bmatrix} ___ \text{e}$$

$$\text{(5')} \quad \gamma \rightarrow \text{w} \;/\; \begin{bmatrix}+\text{syll}\\+\text{high}\\+\text{round}\end{bmatrix} ___ \begin{bmatrix}+\text{syll}\\+\text{high}\\+\text{round}\end{bmatrix}$$

Note that the change involved in rules (4') and (5') is very minor. The voiced fricative loses the feature of consonality, thus becoming a glide. The features for height, backness, and roundness for these glides are determined by the vowels in the

environmental specification. The remaining voiced fricatives will be finally realized as:

(6) β → w

(7) ð → d

(8) γ → Ø

and there will be a low-level rule

(9) w → v

One might claim that rule (7) is unnecessary in our earlier formulation since d would be produced by gradation directly. But in most dialects of Finnish d doesn't appear at all. Instead, the gradated t is either ð, l, or r, or is deleted. The d which appears in the standard language is a result of Swedish influence on Finnish.[7] The voiced dental fricative ð can naturally explain the dialectical appearance of the liquids l and r, also voiced dental continuants, in closed syllables. Similarly, the loss of the dental fricative in some dialects would be similar to the loss of the velar fricative in all dialects, including the standard language. We want to represent the fact that the voiced dental stop d is unnatural in Finnish. A gradation rule directly producing voiced stops would not capture this fact about Finnish.

We have already postulated that our gradation rule for single stops (rule A) is preceded by gradation rules for nasal and liquid environments; namely:

t → l / l ___

t → r / r ___

t → n / n ___

p → m / m ___

k → ŋ / ŋ ___

These rules are strikingly similar. Note first that the original stop is homorganic to the environmental consonant. Further, the environment's consonants are either liquids or nasals, that is, sonorant consonants. We could therefore express a single gradation rule for both liquid and nasal environments:

(B) $\begin{bmatrix}+\text{cons}\\+\text{son}\end{bmatrix}$ $\begin{bmatrix}-\text{cont}\\-\text{son}\end{bmatrix}$ $VC\begin{Bmatrix}C\\\#\end{Bmatrix}$

1 2 3 → 1 1 3

condition: 1 and 2 are homorganic

However, this rule seems to be both an assimilation rule and a gradation rule.

We have tentatively assumed that there is a single gradation rule for non-geminate stops. Let us consider the possibility that our original gradation rule (A) also applies to the consonant sequences mp, nt, ŋk, lt, and rt The environment of rule (A) specifies that the stop must be preceded by a liquid or a nasal. Rule (A) will cause the changes

mp → mβ

nt → nδ

ŋk → ŋγ

lt → lδ

rt → rδ

Now we can postulate a simple assimilation rule:

$$(B)\quad \begin{bmatrix}+\text{cons}\\+\text{son}\end{bmatrix}\begin{bmatrix}+\text{cons}\\+\text{cont}\\+\text{vcd}\end{bmatrix} \quad 1 \quad 2 \rightarrow 1 \quad 1$$

condition: 1 and 2 are homorganic

There is independent evidence for this assimilation rule. In underlying stems in Finnish, as well as in surface forms, the consonant sequences lr, rl, nr, nl, ln, and rn are systematically lacking, although we do find the geminate clusters ll, rr, and nn. We could claim that there is a morpheme structure condition which will specify that a voiced consonantal segment preceded by a homorganic consonantal sonorant will have the same feature specifications as the preceding sonorant:

$$(B'')\quad \begin{bmatrix}+\text{cons}\\+\text{son}\end{bmatrix}\begin{bmatrix}+\text{cons}\\+\text{vcd}\end{bmatrix} \quad 1 \quad 2 \rightarrow 1 \quad 1$$

condition: 1 and 2 are homorganic

This morpheme structure condition additionally acts as a phonological rule. For example, the past participle of tule

'to come' and pure 'to bite' will be derived from the underlying representations tule+nut and pure+nut. The stem-final e vowel will be deleted between dental sonorants, giving us the forms tulnut and purnut.[8] Using rule (B") as a phonological rule, we can explain why the past participles are realized as tullut and purrut. Note that rule (B") includes rule (B') since the voiced fricatives are voiced consonants. Thus rule (B") will produce the correct gradated segments:

mβ → mm

nδ → nn

rδ → rr

lδ → ll

ηγ → ηη

We can therefore eliminate this additional gradation rule (B) by allowing an independently-needed assimilation rule (B") to apply to the output of our original gradation rule (A). Of course, this assimilation rule will necessarily precede rules (4')-(9).

One further note on the environment for our gradation rule. We need the specification of sonorance for two reasons. First, it will block gradation from applying to such sequences as sp, st, and sk since the s is non-sonorant. Second, the extra segmental specification will automatically prevent the gradation rule from applying to a word-initial stop since the stop would

not be preceded by any segment, much less a sonorant segment.

We have now handled all the cases of gradation in Finnish except for the first case, the geminate stops. In accordance with the orthographic convention, we have represented these stops as a sequence of two homorganic stops. On the phonetic level, the geminate consonants are distinguished from single consonants by length.[9] It is not altogether obvious that phonetically long consonantal segments are underlyingly geminates. We must look for evidence that geminate stops exist at some level of representation. Consider first the environment for gradation; gradation takes place in a closed syllable. We have hitherto claimed that any sequence of two or more consonants or a single non-final consonant will close the preceding syllabic segment. Actually, if a sequence of two or more consonants occurs, a vowel must follow.[10] A syllable boundary will be inserted before the last consonant in a sequence of one or more consonants.[11] And of course, a syllable boundary automatically occurs whenever a word boundary occurs. The actual environment for consonant gradation should be

$$[+son] ___ VC.$$

where '.' stands for some underlying syllable boundary. The original environment

$$[+son] ___ VC\begin{Bmatrix} C \\ \# \end{Bmatrix}$$

claimed that there were two environments for gradation. It

missed the generalization that both CC and C# close the preceding syllabic segment.

Now if we assume that there are no underlying geminate consonants, but only long consonants, we will unnecessarily complicate our environment for gradation. We would have to include the fact that long consonants also close syllables; gradation would take place in the environment

$$[+son] ___ V\{^{C.}_{C:}$$

where 'C:' represents an underlying long consonant.

Independently of our gradation problem, we would have to explain why no long consonants ever occur in word-final position. Only single consonants can occur at the end of a word. There is, in fact, a rule that will delete consonants occurring before the word-final consonant:

$$C_0 \rightarrow \emptyset \; / \; ___ \; C\#$$

For example, consider the derivation of the nominative singular form of tarkoitukse 'purpose':

tarkoitukse → tarkoituksi[12] → tarkoituks[13] → tarkoitus

After the final i is deleted, the k preceding the final s must be deleted. Now consider the same derivation for a stem like sydämme 'heart':

sydämme → sydämmi → sydämm → sydäm → sydän[14]

If the sequence mm is actually a long m in underlying representation, we will have to change our rule of consonant deletion to

two rules:

$$C_0 \rightarrow \emptyset \; / \; ___ \; C\#$$

$$C\text{:} \rightarrow [\text{-long}] \; / \; ___ \; \#$$

The only common factor between these two rules is that consonants are altered in word-final position. The problem is that every time a rule involves sequences of consonants, we will have to build an extra subpart into the rule to account for the underlying long segments. In order to simplify our rules, we need only claim that phonetically long clusters are underlyingly geminates.

There is, in fact, independent evidence for a phonetic rule that converts an underlying sequence of homorganic stops to a long consonant.[15] Consider the derivation for the partitive of käte 'hand':

käte + tä → kättä → kät:ä

The stem-final e is deleted between the two dental stops. Phonetically, we end up with a long dental stop. In any event we will need a rule converting derived geminates into long segments.

The environment for gradation, however, also gives evidence that at the point the gradation rule applies to an underlying geminate stop, the stop has already been converted to a phonetically-long segment. To show this consider the possi-

bility that the gradation rule for geminates deletes one of the two homorganic stops. The problem is in determining which stop the rule will delete. The choice is completely arbitrary. We could delete the first or second of the stops:

$$(C)\quad [+son]\ \begin{bmatrix}-cont\\-son\\\alpha F\end{bmatrix}\ \begin{bmatrix}-cont\\-son\\\alpha F\end{bmatrix}\ VC. \qquad 16,17$$

$$1 \quad 2 \quad 3 \quad 4 \quad \rightarrow \quad 1 \quad \emptyset \quad 3 \quad 4 \quad \text{or}$$

$$1 \quad 2 \quad \emptyset \quad 4$$

In trying to chose between these two alternatives, we might try to argue that the structural change in rule (C) should be

$$1 \quad \emptyset \quad 3 \quad 4$$

since this would avoid some complications in the rules for syllable division. Consider the word kirkko 'church', which will be divided into syllables as kirk.ko. If the second stop is deleted, we would have kirk.on. Then we would need an additional rule to alter the syllable structure to kir.kon. If the first stop is deleted, there will be no need for this re-adjustment rule. The problem with this argument is that there is independent evidence for such a rule. Consider the derivation of the nominative singular for velje 'brother':

$$velje \rightarrow velji \rightarrow veli$$

The j is deleted before the final i. Before that rule takes place the syllable boundary is between the l and the j: vel.ji. After the rule operates, the syllable boundary must be shifted

to give us ve.li. The rules for syllable structure automatically apply in Finnish. If the second stop is deleted in kirk.ko, the syllable structure rule would apply.

In order to avoid specifying which of the stops is deleted, our rule could be:

$$(C') \quad \begin{bmatrix} -\text{cont} \\ -\text{son} \\ \alpha F \end{bmatrix} \begin{bmatrix} -\text{cont} \\ -\text{son} \\ \alpha F \end{bmatrix} \rightarrow \begin{bmatrix} -\text{cont} \\ -\text{son} \\ \alpha F \end{bmatrix} / [+\text{son}] ___ \text{VC}.$$

In using rule (C') we must somewhere specify that both stops are homorganic. Otherwise, the rule would apply to the sequence of stops in matka+n. If gradation gave us *makan or *matan, then we would have crucial evidence for a rule like

$$(C'') \quad [+\text{son}] \begin{bmatrix} -\text{cont} \\ -\text{son} \end{bmatrix} \begin{bmatrix} -\text{cont} \\ -\text{son} \end{bmatrix} \text{VC}.$$

$$1 \quad 2 \quad 3 \quad 4 \rightarrow 1 \quad \emptyset \quad 3 \quad 4 \quad \text{or}$$

$$1 \quad 2 \quad \emptyset \quad 4$$

If this were the case, we wouldn't need the specification for homorganity. This restriction claims that gradation doesn't really apply to sequences of stops. If we proposed that consonant gradation applied only to phonetically long consonants, we wouldn't need to restrict the rule of gradation to homorganic stops. Our rule for the gradation of homorganic stops could therefore be:

$$(D) \quad \begin{bmatrix} -\text{cont} \\ -\text{son} \\ +\text{long} \end{bmatrix} \rightarrow [-\text{long}] / [+\text{son}] ___ \text{VC}.$$

There is a problem with this rule, however. Consider a verb stem like viittata 'to point out'. In deriving the infinitive form, the final a will be deleted between the two t's:

viittata + tah → viittattah

We must convert the first sequence of tt into a phonetically long stop, but leave the second sequence as a homorganic sequence in order to meet the environment for gradation. Then when gradation applies to the second tt, it must be converted to a long stop. There is evidence in Finnish that several rules apply from left to right, including the rule of gradation itself.[18] If we let our rule of phonetic lengthening apply from left to right and before any given application of gradation, we can account for the derivation of viitatah:

| | |
|---|---|
| underlying representation | viittata + tah |
| phonetic lengthening | viit:ata + tah |
| a-deletion | viit:attah |
| gradation | viitattah |
| phonetic lengthening | viitat:ah |
| gradation | viitatah |

By this formulation, the rules of phonetic lengthening and gradation are applying in a cycle. Such a solution is in agreement with other arguments for a cycle in Finnish.

We have assumed that the gradation rule for long stops is separate from the gradation rule for single stops, rule (A).

Let us consider the proposition that rule (A) actually does apply to geminate stops. Of course, we still have the problem of determining which stop would be gradated to the voiced fricative. Suppose that rule (A) applied to the first stop, so that gradation would produce the sequences βp, δt, and γk. We would then need a rule to change βp to p, δt to t, and γk to k. Now the question is: Is there any evidence for a rule of the nature

$$\begin{bmatrix} +\text{cont} \\ +\text{vcd} \\ +\text{cons} \end{bmatrix} \rightarrow \emptyset \; / \; ___ \; \begin{bmatrix} -\text{cont} \\ -\text{son} \end{bmatrix}$$

Unfortunately, this proposed rule would eliminate such consonant clusters as rk, rt, rp, lk, lt, and lp in Finnish, which do occur: arka 'sensitive', virta 'stream', arpa 'chance', alku 'beginning', aalto 'wave', and halpa 'cheap'. Thus we would have to reformulate our rule to act only on non-sonorant segments; that is, on only those voiced continuants produced by gradation:

$$\begin{bmatrix} -\text{son} \\ +\text{cont} \\ +\text{vcd} \end{bmatrix} \rightarrow \emptyset \; / \; ___ \; \begin{bmatrix} -\text{cont} \\ -\text{son} \end{bmatrix}$$

This rule is ad-hoc since there is no other evidence for its existence in Finnish.

On the other hand, suppose that rule (A) applied to the second stop, thus producing the sequences pβ, tδ, and kγ. Again, we would need a rule of the form

$$\begin{bmatrix}+\text{cont}\\+\text{vcd}\\+\text{cons}\end{bmatrix} \rightarrow \emptyset \; / \; \begin{bmatrix}-\text{cont}\\-\text{son}\end{bmatrix} __$$

to change pβ to p, tδ to t, and kγ to k. This rule, like the other one, would eliminate the consonant clusters kr, tr, pr, kl, tl, and pl in Finnish. Although these clusters do not occur with any great frequency in Finnish, there are a few examples of words containing clusters of stops followed by liquids: vuokra 'rent', vikla 'sandpiper', atrain 'fish spear', hiprakka 'state of drunkedness', kupla 'bubble'. Again our proposed rule would eliminate such clusters. Historically, such clusters have actually been eliminated, but whenever they have been, it has been the stop and not the liquid which has been affected. Thus atrain → ahrain 'fish spear', nakris → nauris 'turnip', eklen → eilen 'yesterday'.[19] So if we restrict our rule to apply to only non-sonorants, we will again have an ad-hoc rule. It appears then that there is no natural way to make the gradation rule for single stops apply to geminate stops.

In summary, there are two rules of gradation in Finnish, one to shorten the phonetically long stops and another to gradate the single stops. The environment for both rules is the same. In some sense, we want to claim that both gradation rules are the same. Both rules weaken stops in closed syllables. No rules are ever crucially ordered between these gradation rules. For a given stop in a closed syllable, only one of the rules will

apply. We could order the rules disjunctively in order to prevent gradation from re-applying to a stop which has already been gradated.[20]

In many borrowed words, geminate stops obey gradation while single stops do not. For example, the genitive of auto 'car' is auton, not *audon, but the genitive of Amerikka 'America' is Amerikan, not *Amerikkan. If we only have one gradation rule we must state that borrowed words containing single stops are not subject to gradation. If we have two separate rules -- or two subparts to a single rule -- we need only say that the gradation rule for long stops applies to borrowed words.[21] Similarly, this phenomenon holds for proper names in the native vocabulary of Finnish. The genitive of Sirpa is Sirpan, not *Sirvan, but the genitive of Sirkku is Sirkun rather than *Sirkkun.

We have proposed the following two rules to handle gradation of stops in Finnish:

$$\text{(D)} \quad \begin{bmatrix} -\text{cont} \\ -\text{son} \\ +\text{long} \end{bmatrix} \rightarrow [-\text{long}]$$

$$\text{(A)} \quad \begin{bmatrix} -\text{cont} \\ -\text{son} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{cont} \\ +\text{vcd} \end{bmatrix}$$

Both rules occur in the environment of the closed syllable:

$$[+\text{son}] ___ \text{VC}.$$

If rule (D) applies to a given consonant cluster, rule (A)

cannot. Our independently motivated assimilation rule will now apply:

(B") $\begin{bmatrix}+\text{cons}\\+\text{son}\end{bmatrix}\ \begin{bmatrix}+\text{cons}\\+\text{vcd}\end{bmatrix}$

1 2 → 1 1

condition: 1 and 2 are homorganic

The velar fricative produced by rule (A) will now be altered in certain special environments to a glide:

(4') $\gamma \rightarrow j\ /\ \begin{bmatrix}+\text{cont}\\+\text{son}\\-\text{syll}\end{bmatrix}$ ___ e

(5') $\gamma \rightarrow w\ /\ \begin{bmatrix}+\text{syll}\\+\text{high}\\+\text{round}\end{bmatrix}$ ___ $\begin{bmatrix}+\text{syll}\\+\text{high}\\+\text{round}\end{bmatrix}$

In standard Finnish all the remaining voiced fricatives will be eliminated by the following rules:

(6) $\beta \rightarrow w$

(7) $\delta \rightarrow d$

(8) $\gamma \rightarrow \emptyset$

In all environments the glide w will be realized as v:

(9) $w \rightarrow v$

FOOTNOTES

[1] Unless the example is a verb, the first form is the stem of a noun or adjective, the second is the genitive singular.

[2] kuljen is the present first person singular of the verbal stem kulke.

[3] puhjetah is the infinitive form of the verbal stem puhketa derived as follows:

puhketa + tah → puhkettah → puhjetah

Incidentally, this example shows that gradation applies either from left to right or simultaneously. Both hk and tt must be in closed syllables when gradation applies.

[4] pyrin is the present first person singular of the verbal stem pyrki.

[5] In all cases ht gradates to hd. Further, hke always gradates to hje. This implies that the alternation hk ~ h should be viewed as the normal, expected case. Those words in which alternation does not occur should be viewed as exceptions. Historically, these items may not have been exceptions since many h's have been derived from obstruents (cf. Hakulinen and Rapola). As will be seen, gradation does not apply to stops preceded by other obstruents, such as s.

[6] For example, the verb stem käy [käü] 'to visit' has the imperfect form kävi. The problem is to naturally explain the v in the imperfect form and the loss of the high round vowel ü which is found in the underlying stem. Independently, we can show that Finnish has a rule of the form

$$\begin{bmatrix} +\text{syll} \\ +\text{high} \end{bmatrix} \rightarrow [-\text{syll}] \; / \; [+\text{syll}] ___ [+\text{syll}]$$

For example, the genitive of poika 'boy' is pojan, not *poian. We can use this rule to explain the v in the imperfect of käy. The underlying form would be käü+i. ü → ʊ would occur intervocalically, giving käʊi. A low-level rule changing the rounded glides w and ʊ to the voiced fricative v would be very natural since both segments are already voiced and continuous.

[7] Collinder (1965), p. 68.

[8] There is a general rule of e and ä deletion in Finnish. In verb stems e is deleted in the environment

[+syll] [dental sonorant] ___ + [non-labial stop] V

In nouns and adjectives, e is deleted after t also:

[+syll] [dental consonant] ___ + [non-labial stop] V

ä-deletion is basically the same except that it is blocked from applying in the second syllable (cf. Skousen (1971), pp. 4-17).

[9] Skousen (1970a).

[10] Except in obvious loan words, consonant clusters can only occur internal to the word.

[11] In the native vocabulary, syllable boundaries (here represented as '.') occur in the following positions: V.CV, VC.CV, and VCC.CV.

[12] e → i / ___ #

[13] In the native vocabulary, i → Ø / ___ # unless i ends a two-syllable stem.

[14] m → n / ___ #

[15] I owe much of the following argument to Charles Pyle. He noticed that the gradation of geminates is arbitrary in that either one of the stops in the geminate could be deleted. He suggested that the rule of gradation actually applies to long segments rather than to a sequence of homorganic segments.

[16] Actually the environmental specification of sonorance is predictable for the gradation of geminates since no geminate occurs in word-initial position and s never precedes a geminate consonant cluster. In other words, a sonorant segment must precede every geminate cluster.

[17] The notational device αF specifies that all other segmental features are the same. This guarantees that both stops are identical.

[18] Cf. L. Anderson (1967) and Skousen (1970b), pp. 35-51.

[19] Rapola (1966), pp. 197-218.

[20] We could equivalently switch the order of these rules and allow the rules to apply conjunctively. But of course the rule for single stops would never feed the rule for phonetically long stops. Thus the conjunctive ordering would be trivial.

[21] S. Anderson (1969), pp. 103-109.

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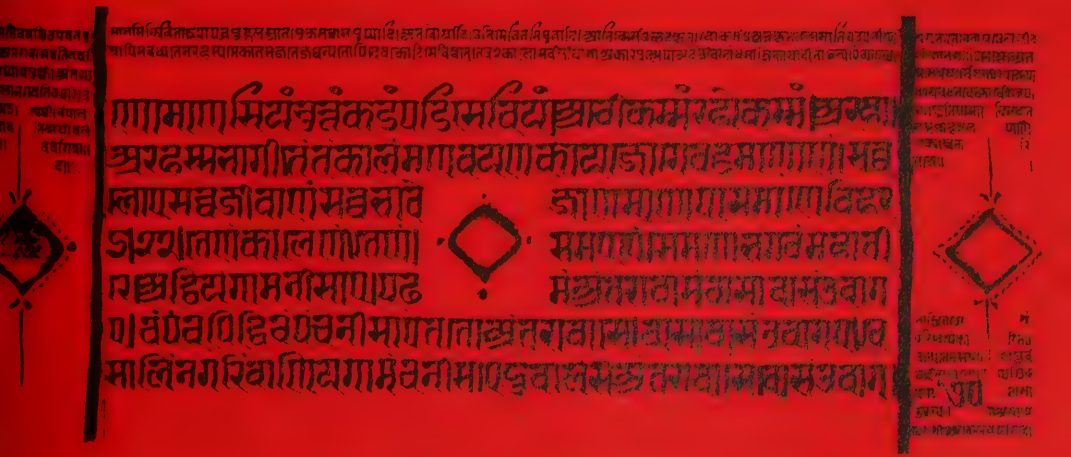
LUME 1 NUMBER 2 FALL, 1971

# PAPERS ON HINDI SYNTAX



DEPARTMENT OF LINGUISTICS, UNIVERSITY OF ILLINOIS
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# STUDIES IN THE LINGUISTIC SCIENCES

(WORKING PAPERS)

SPECIAL ISSUE

## PAPERS ON HINDI SYNTAX

Edited by

Yamuna Kachru

**VOLUME 1 NUMBER 2**

**FALL, 1971**

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# F O R E W O R D

In 1966, this department initiated research in various linguistic aspects of the Hindi language. The earlier results of our research have been incoroporated in *An Introduction to Hindi Syntax* (1966), *Studies in a Transformational Grammar of Hindi* (1968), and in several journals of our profession.

In this special issue of *SLS* entitled *Papers on Hindi Syntax*, we are pleased to present the recent work of students and faculty of our department. It is needless to say that these papers are essentially working papers and are being circulated mainly for comments and suggestions from our colleagues. It was not possible to include the following two papers in this issue due to limitations of time and space:

Tej K. Bhatia, "Negation in Hindi"
Geoffrey Hackman, "Some problems with Equi-NP deletion in Hindi"

We hope that these will be circulated soon.

Due to a number of reasons, the editing of the manuscripts is far from satisfactory. I have, therefore, added an "errata" sheet at the end which includes some of the important corrections.

I wish to express my gratitude to Geoffrey Hackman for his comments, to Sona Janjigian for typing my paper, to Sue Dennis, Pat Mooney, and Josephine Wilcock for helping in the production of this monograph.

Yamuna Kachru

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# MOVEMENT IN RESTRICTIVE RELATIVE CLAUSES IN HINDI

by

SUSAN K. DONALDSON

June, 1971

## I. Introductory Remarks[1]

Inflected languages, such as Latin, are noted for having more or less free word order within clauses, as syntactic relationships are held constant by the identifying case markers attached to nominal and verbal stems. Thus, for example, an adjective need not occur adjacent to the noun that it modifies, so long as both are marked for being the same case. Ross (1969:292) gives an example of such an occurrence: Pulchram homō amat fēminam bonus 'the good man loves the beautiful woman', in which pulchram 'beautiful', while modifying fēminam 'woman', actually precedes homō 'man', while bonus 'good', which modifies homō 'man', precedes fēminam 'woman'. We would assume, though, that in underlying structure the adjectives cooccur with their respective nouns, and that there is some sort of free word order rule in operation which allows for unrestricted movement of elements within the clause (see Ross 1969:292 for such a rule). On the other side of the coin from the inflected languages are word order languages such as English, which, as their name suggests, determine syntactic relationships on the basis of the order and cooccurrence of their words. In the grammar of these languages, movement rules play an important role, as permutations in word order have serious consequences as regards meaning. If the English equivalents were simply plugged into the above Latin sentence, for example, then what we would have would be 'the handsome man loves the good woman', something quite different from the meaning implied by the case endings. Thus, studies in English grammar in the past decade or so have called attention to processes in the language that can be described by means

of rules like the following--all effecting the movement of some element within a sentence to some other position in it: it-Extraposition (It pleases me that John came from [it [John came] pleases me], Clefting (What Bill broke was the window and The one who broke the window was Bill from [Bill broke the window] but evidencing different presuppositions), Pseudoclefting (It was the mirror--and not the window--that Bill broke), Left Displacement (Bill--he broke the window--was playing here), Yiddish movement (Happy that he came I'm not), etc. A happy circumstance in English is that two important structures, the information question and the relative clause, can both be formulated by the same movement rule, which says that a copy of the noun phrase which is to be questioned or relativized is moved to the front of its clause and converted to a relative pronoun; then the old occurrence of the noun phrase is deleted. Thus, from an underlying structure like [Bill broke SOMETHING], the NP representing SOMETHING can be moved to the front of the clause and relativized, producing the question What did Bill break? (other rules obligatorily convert broke to the discontinuous did break to bring about the necessary shape for a surface question). If a structure like We saw the oranges occurs with another clause containing a reference to a noun identical to one in this clause, then similar movement to the front and relativization take place, yielding e.g. The oranges [which we s$\Lambda$w] were fresh. It can readily be appreciated that using the same basic characterization for a rule to handle two separate processes is considered quite economical, as this will mean that the speaker has only one rule, rather than two, to keep in his brain; and the very

fact of the productiveness of the rule lends credence to its assertions concerning these processes in English.

Hindi, which displays some inflection (e.g. there is a masculin - feminine gender system, with separate singular and plural endings, as well; there are two cases, direct and oblique, with distinctive endings) and also marks syntactic relationships by word order (e.g. verbs are clause-final; Hindi postpositions function very similarly to English prepositions, except that nouns occurring with postpositions are marked by being in the oblique case, in addition to their cooccurrence with the postposition), lies somewhat at midpoint between these two extremes as regards movement of elements within clauses. That is, word order is neithe so completely free as it is in Latin nor so severely constrained as it is in English. Major constituents can move around with quite a bit of freedom. For example, a typical English transitive verb sentence has two basic forms, one having the order Subject-Verb-Direct Object-to+ Indirect Object (e.g. I gave a book to Bill) and the other having the order Subject-Verb-Indirect Object-Direct Object (e.g. I gave Bill a book), in which case the preposition to deletes. In Hindi, too, either the direct or the indirect object can come first; but in Hindi there is no additional marking; the postposition ko, which occurs with the indirect object does not delete in either position: thus, mɛ̃ ne Bill ko kitab dī and mɛ̃ ne kitab Bill ko dī (the ordering with indirect object first is probably more frequent, though). When an adverb is added, the greater freedom of movement in the Hindi clause can easily be seen. Thus, there can be

(1a) kəl mɛ̃ ne Bill ko kitab dii (kəl 'yesterday')

mɛ̃ ne kəl Bill ko kitab dii

mɛ̃ ne Bill ko kəl kitab dii

mɛ̃ ne Bill ko kitab kəl dii

For some of these the English equivalents are perfectly acceptable; for others, not so good:

(1b) Yesterday I gave Bill the book.

?I yesterday gave Bill the book.

*I gave yesterday Bill the book.

?I gave Bill yesterday the book.

I gave Bill the book yesterday.

(Interestingly, due to the clause-final position of verbs, this last example is ungrammatical in Hindi: *mɛ̃ ne Bill ko ek kitab dɛ̃ kəl.) Because of this greater freedom of movement for consitutents, movement rules do not figure so actively in an account of Hindi syntax as they do in one of English. And one reason for the doubt that Hindi relatives are derived by a movement rule, although Hindi relative clauses have a shape very much like that of the English ones, with the relative pronoun, jo, or one of its inflected forms, occurring clause-initially, is that there is not the handy correspondence of the question form as there is in English. In the case of Hindi, information questions are formed by substituting a question pronoun in place of the item being asked about--and leaving it in its natural position, rather than fronting it. Thus, such a fronting rule in Hindi grammer may look 'funny' and out of place. The particular research with which this paper is con-

cerned has to do with this matter of what role rules of movement may play in determining the surface shape of restrictive relative clauses in Hindi. Before we get on to the data that I used to do the generalizations that I have drawn from them, let us first look at some of the treatments relative clauses have been given in fairly recent studies in transformational-generative grammar, first in English, and then in Hindi.

## II. About Relative Clauses

### A. In English

Relative clauses in both English and Hindi are of two kinds: appositive (A) and restrictive (R). Although our concern here will be mostly with restrictive ones, we will be saying a few things about appositive ones, too, so it is important that the distinction be made. As its name implies, an appositive clause is in apposition to the noun it modifies, and it is separated from the noun by an intonation break. Appositive relatives are used to add information to what has already been said about the particular noun. These are the relatives typically used with proper nouns:

e.g. (2) Professor Whiz, who had gotten his Ph.D. at the age of twenty-two, rarely let anyone forget his precocity.

but they can also occur with common nouns, providing the noun referred to is anaphoric to some previous mention in the discourse:

3.g. (3) Two people came late to the party, a man and a woman. The man, who was rather timid, hesitated to join in the conversation.

As can be seen from these examples, appositive relatives reveal some additional fact about their referent nouns, besides what is stated in

the main clause, which the speaker feels may be of interest to his audience or which he feels adds to the total picture he is painting.

Restrictive relatives, on the other hand, play a determining role. Their inclusion in a sentence is not optional, something tossed in to amuse the audience, as that of appositives is. Rather, on the basis of his awareness of his audience's knowledge of the situation he is describing, the speaker feels obligated to include the restrictive relative in order to specify the noun to which he is referring. That is, as he evaluates the situation, the speaker realizes that his audience has cognizance of more than one member of the class to thich the relativized noun refers. Having this realization, he includes in the sentence some bit of information which will give the noun unique reference. Thus, restrictive relatives rarely occur with proper nouns because proper nouns usually bear unique reference, anyway. This is not to say that restrictive relatives cannot occur with proper nouns; they do, in fact, occur with them, provided that the reference of the proper noun is not unique (cf. the 'Sandy Koufax' sentences in Postal n.d.:29). For instance, if there were two Professsor Whizes at some university, one in mathematics and one in geology, then it would be proper to report, say,

(4a) The Professor Whiz who teaches geology went rock-hunting over the weekend.

In fact, so long as the audience knows of both professors, the sentence would have vague reference without the restrictive relative and would, without a sufficient context, be inadequate; although under the circumstance of there being only one Professor Whiz known to the audience, the main clause alone would be fine:

(4b) Professor Whiz went rock-hunting over the weekend.

Note that if the audience does not know of both professors, if he knows of only one of them then sentence (4a) is anomalous, and a perfectly natural response on his part would then be to ask, 'You mean there's more than one Professor Whiz?' What is of concern, in other words, in the usage of a restrictive relative is neither the knowledge on the part of the speaker, not the actual knowledge on the part of the audience, but, rather, the speaker's assessment of the knowledge on the part of the audience. Then, without a context to specify anaphoric reference, the relative that occurred in sentence (3) would necessarily have been a restrictive one:

(3a) The man who was rather timid hesitated to join in the conversation.

Moreover, it must be assumed that in this instance the speaker is talking about a class of men of which one member, and only one, is considered timid by the person to whom the speaker is talking--is so considered by him, that is, in the speaker's estimation.

In English both types of relatives share a number of features, some of which are pointed out by Postal (n.d.:18):

(I) both end up next to another NP
(II) both make use of wh marking of pronominal forms and the special fronting word order associated with this (There are differences of course, that, etc.)
(III) both can be reduced to yield pronominal modifiers ...
(IV) neither can occur next to an NP which is [+Anaphoric], a feature assigned by the rules of pronominalization to that one of two referentially identical NP which is getting changed ...

As we have seen in sentence (3), an appositive relative can occur with an anaphoric noun. What Postal is getting at in his fourth condition,

though, is that after pronominalization, this kind of cooccurrence does not happen:

(3b) *He, who was timid, hesitated to join in the conversation.

(3c) *He who was timid hesitated to join in the conversation.[2]

Moreover, he lists tests for determining which sort of relative one is dealing with in a puzzling situation. According to him, a restrictive relative will have the following characteristics:

a) presence of relative pronoun that (or its substitutability in the clause). [Thus, the boy who/that came ...
*the boy, that came ...]
b) impossibility of parentheticals like by the way, incidentally [e.g. *The man who, by the way, was timid was afraid to join in the conversation]
c) impossibility of quatiifiers some of which, three of which, etc. [e.g. *The boys some of whom were late missed dinner.]

Crucial in the occurrence of a relative clause, and so basic that it is often skipped over is the fact of there being a shared noun phrase between the two clauses--the NP, naturally, that gets substituted for by a relative pronoun. Carlota Smith in her early (1964) work on relatives, called attention to this noun common to both clauses and made it the condition for the embedding of a relative beneath the modified noun. She asserts (1969:250), 'The relative transformation has no direction: if two sentences share a noun phrase, either may be embedded to the other as a relative clause', and then spells out a rule for relative adjunction that specifies that it can only apply in case there is identity between elements in the two clauses (1969:251):

R relative adjunction

Structure: $S_1$: X Y Z (R) (A) W

1 2 3 4 5 6

$S_2$: X Y (R) (A) Z W
7 8 9 10 11 12

Conditions: (i) x is not null
(ii) 3 + 4 + 5 = 9 + 10 + 11
(iii) 2 ... 5 is NP

Change: 1 2 3 Wh 1 2 4 5 6

Because of her assertion of nondirectionality, she is forced to build the optional (R) and (A) relatives into the descriptions of both strings and therefore gets a rather clumsy structure. Moreover, her remarks about the nondirectionality of the relative transformation are not even true. The nondirectionality principle would argue that there is no difference between (3) and (3e):

(3e) The man who hesitated to join in the conversation was rather shy timid.

But as we have seen, the direction makes quite a bit of difference with R relatives. Specifically, the matter of which clause gets relativized depends crucially on which expresses the assertion (the main clause) and which the knowledge presupposed to be available to the audience (R relative).

A year after Miss Smith's study Chomsky took account of the shared noun requirement by introducing the new convention of sentence-boundary symbols (#'s). In Chomsky's view relatives are generated as S's and are embedded below the noun they modify. Generating them as full S's permits use of the same rules as for main clauses and is thus economical. It can be seen, though, that such a process could easily result in two unrelated S's being arbitrarily yoked together by means of relative embedding. One means of restriction would be to have a separate rule to generate relative clauses and constrain it to have an NP identical to one in the main clause. This, however, would involve expensive markings (it would have to be specified just which NP's were identical, e.g.) and the general similarity in structure of relatives and full sentences would be lost. The use of sentence boundaries, while somewhat artificial, gets around this problem. Thus, in order to avoid having horrors like

(5) [I saw the boy [John loves Mary]]

in output structure, Chomsky recommends generating sentences with boundary symbols at either end. If the lower S contains a noun identical to the one it is embedded under, then the noun of the embedded S will be converted into a relative pronoun and its original form will delete. Moreover, when this occurs, the boundary symbols will also delete. 'We can then establish the convention,' Chomsky writes, 'that a well-formed surface structure cannot contain internal occurrences of #. Such occurrences will indicate that certain transformations that should have applied were blocked.' (1965:138) Thus, structures like (5) may very well be generated, but because the identity condition is not met, they will never get pronounced.

In her analysis Carlota Smith showed the relative clause as embedded under the determiner attached to the modified noun. From the determiner it would be moved to be sister-adjoined to the right of the noun. Chomsky, too, asserts the relationship of R relatives and determiners (1965:217, n. 26). Reasons for establishing this relationship can be found in sentences we have already worked with. Restrictive relatives can occur with either definite or indefinite articles; and it is only those occurring with the definite article that have the property of unique reference. Compare (3 with (3f):

(3f) A man who was rather timid hesitated to join in the conversation.

Obviously, the <u>the</u> of (3) is crucial in establishing the sense of uniqueness we have associated with the R relative. Leroy Baker (1968:43-4) has called attention to this property, speaking of it in terms of the exhaustiveness of the reference:

... the condition can be stated roughly as follows: if a definite

noun phrase with a restrictive relative is used to refer to one or more individuals from a domain understood in the discourse, then if x is a member of the domain and x has the property specified in the relative clause, then x must be one of the individuals referred to. A comparison of 3.45) and 3.46) will make this condition somewhat clearer.

3.45 John and Bill came early, and Harry and Paul came early, too.

3.46 @John and Bill were the ones who came early, and Harry and Paul were the ones who came early, too. [Baker uses the @ to mark semantically deviant sentences, reserving * for those which are syntactically ungrammatical.]

Thus, we understand the first clause of sentence 3.46) as meaning that John and Bill were the only ones who came early, and when we are told that the set has not been exhausted, that others also came early, the sentence becomes uninterpretable. As we shall see, determiners and restrictive relatives are also linked in Hindi.

Before turning to Hindi, though, we must first examine another claim about English relative clauses. This involves the relatively recent claim by those generally associated with the generative semantics school of thought (although in this case their assertion about relatives is not related to generative semantics) that relatives arise not from an embedded source, but that in deep structure the trees for what will become the main and subordinate clauses are conjoined, that is, that they are on the same level. The first arguments for this concerned appositive relatives and largely consisted of paraphrasing. Thus, Ross (1967) noted that the following sentences are substitutable:

(6a) John saved Bill and he is no doctor.

(6b) John, and he is no doctor, saved Bill.

(6c) John, who is no doctor, saved Bill.

As we have earlier mentioned, appositive relatives simply give additional information about the noun in question, and an additional assertion about it. With them Carlota Smits's claim of nondirectionality seems to hold; and it is not difficult to envision that the reason for this nondirectionality is that they are underlyingly coordinate; neither is subordinate to the other.

That restrictive relatives as well come from a conjoined source has been argued by Sandra Annear (1967) on the basis of cooccurrence restrictions. Thus, she points out that just as one cannot say

(7a) *The singer is old and he is young,

so also

(7b) *The singer who is old is young

is ungrammatical. Since both appositive and restrictive relatives would then come from the same source, Annear postulates that they be distinguished in having the rightmost S in the underlying structure become the surface main clause, and the leftmost a surface restrictive relative; if, on the other hand, the leftmost S becomes the surface main clause, then the relative, coming from the underlying rightmost S will be an appositive. There are no strong arguments supporting this specific ordering, however, and it appears to be just an ad hoc method of accounting for the differences of A and R clauses.

Neither paraphraseability nor similarity of cooccurrence restrictions provides a very substantial syntactic argument. But such syntactic

arguments have been pointed out by Postal (n.d.) against the embedded-in approach. One of the strongest of these involves the truth of psychological predicates such as think, believe, ect. The complement of such a verb can contain a denial of itself; and in such a case it is interpreted as menaing that the subject of the main clause simply wasn't aware of all the facts. Thus, the most natural interpretation of (8) is that the book was burned, but Charley didn't believe that it had been, not hearing about it, or something.

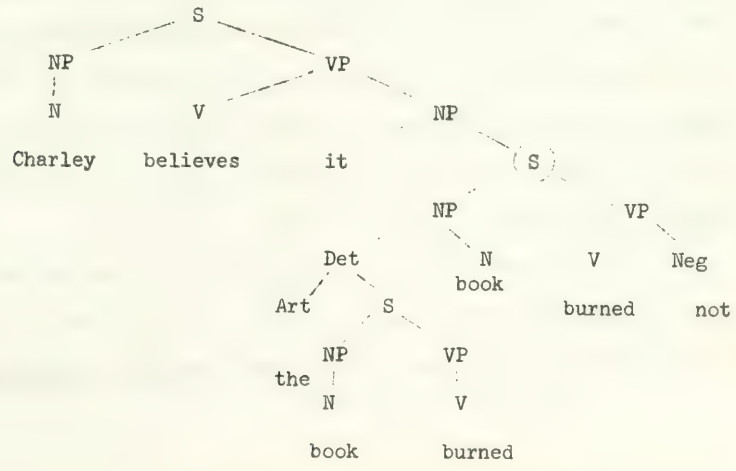
(8) Charley believes that the book which was burned was not burned.

Another interpretation exists for this sentence, though, that being that Charley believes the whole of the complement. In this strained interpretation Charley believes a denial, a structure which cannot appear by itself on the surface:

(8a) *The book which was burned was not burned

But under the embedded-in appraoch, this is the only interpretation that can be given the sentence, as the tree strucutre shows:

(8b)



Under the embedded-in analysis what Charley believes is necessarily the circled S. Having pointed out this observation, Postal (n.d.:10) says,

> Clearly no structural account which requires all R to originate inside the NP they modify can possibly account for this. In some way, at least some R must originate outside the NP they end up in.

Leaving restrictive relatives momentarily, Postal confronts the probelm of the nondirectionality of appositive relatives. If they come from a conjoined source, then he hypothesizes that perhaps the clause that becomes the main clause is simply marked [+Main], and that which will become the relative clause is marked [-Main]. The following sentences could then be seen as coming from the same underlying structure, then; yet they could all be distinguished:

(9a) Charley, who is a dope, won.

(9b) Charley, who won, is a dope.

(9c) Charley won and he is a dope.

(9d) Charley is a dope and he won.

That is, in the last two sentences both clauses would be marked as [+Main], while those of the first two would bear different markings, the main clause in either case being +, the relative, -. The explanation is rather mindless, of course, and does not express anything particularly deep about the syntax or logic of the sentences; but it does acoomplish the task of distinguishing the output forms.

A valuable contribution of Postal's paper is its recognition of the role played by restrictive relatives in disjunction. He writes (n.d.:23),

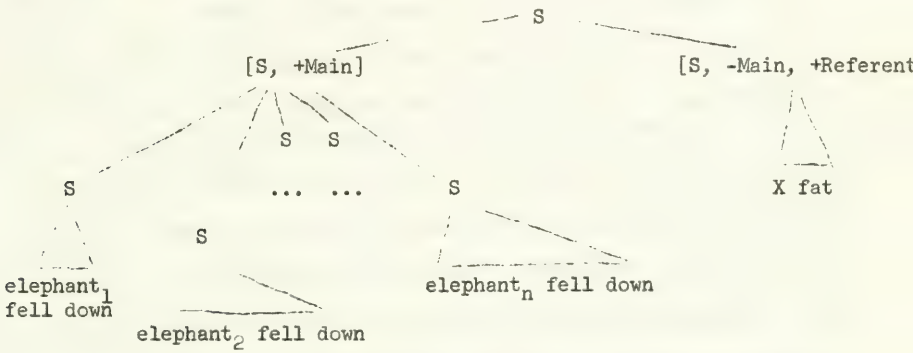
> Suppose that we assume that an R modifies not a referentially

> vague NP but a vague assertion. ... I would like to suggest that the main clause of every R is in fact a disjunction. And the proper interpretation of the R is that it provides information intending to pick the correct disjunct from the set [italics his].

That is, the referent noun belongs to a set of members$_{1-n}$; the restrictive relative defines just which member of the set is being referred to. On this basis he then posits an underlying structure for the sentence

(10) the elephant who was fat fell down

that looks like




with the restrictive relative coordinate with the whole possible set of referent nouns (Postal n.d.:24). The restrictive relative then determines which member of the set is meant.

Other syntactic arguments besides that involving psychological predicates exist pointing out the weaknesses of the embedded-in approach and supporting a conjunctive analsyss. Geis (1971) has reported the following ones among others by Ross, involving the surface appearance of too and either, plus the matter of sentential pronominalization. As concerns the first of these note that too typically appears in con-

joined structures:

(11) Bill came, and Harry came, too.

but that it does not appear in noun complements (where there is little doubt that there is an embedded S in underlying structure):

(11b) *The fact that I surprised Bill surprised Mary, too.

However, too does occur with relatives:

(11c) Bill, who wanted to go to the ballgame, wanted me to go, too.

(11d) The girl that Bill surprised surprised him, too.

The same arguments hold for the surface occurrence of either:

(12a) Bill didn't come, and Harry didn't, either.

(12b) *The fact that I didn't surprise Mary didn't surprise me, either.

but (12c) Bill, who didn't go to the ballgame, didn't go to the movies, either.

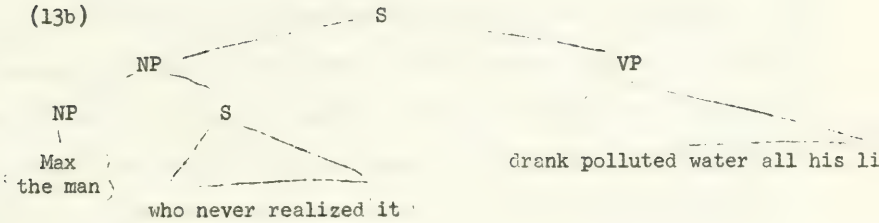
and (12d) The girl who I didn't speak to didn't speak to me, either.

If the embedded-in analysis of relatives were right, then we would expect the behavior of relatives and noun complements to be similar, and that of relatives and conjoined structures not necessarily to be so. But just the reverse is the case, as we have just seen.

Another argument given be Ross for a conjunctive analysis involves sentential pronominalization. Under the embedded-in analysis discontinuous constituents could not pronominalize. Sentence (13a) is perfectly acceptable in English, but as tree (13b) shows, under an embedded-in analysis there would be no node for the it to be pronominalizing.

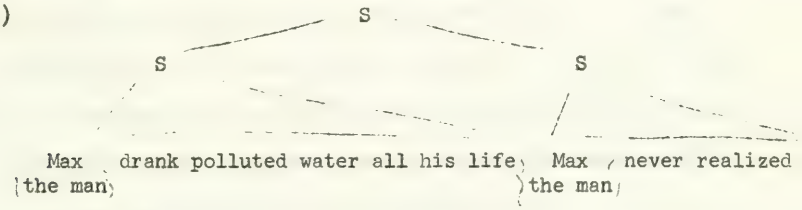
(13a) Max, / The man } who never realized it (,) drank polluted water all his life.

(13b)




But with a conjunctive analysis, there is a readily available S-node for pronominalizing:

(13c)




B. In Hinid

Turning now to Hindi relative clauses, we shall first examine the A/R distinction and how it is manifested. Besides being distinguishable on the basis of whether or not there is an intonation break between the referent noun and the relative clause, A and R relatives also display separate distribuitions. An appositive relative can occur only directly after the noun it modifies; but a restrictive relative can occupy any of three positions: like the appositive, it can occur directly following the modified noun, it can precede the main clause, or it can follow the main clause. Such freedom is not bought without a price, however. There is a constraint in Hindi that says that the noun shared by the main and the relative clauses must occur in whichever clause occurs first (temporally first, that is, in the surface structure representation).

The occurrence of the shared NP in the temporally second clause is then deleted, and only a pronoun appears there. If the relative clause appears first, then it is the distant third person pronoun vəh (or one of its variants) which appears in the second clause; if the main clause occurs first, then it is the relative jo (or one of its variants) which appears in the second clause. As in English, there is a definite tie-up between restrictive relatives and the determiner system in Hindi. Normally ə Hindi null determiner corresponds to the English definite determiner, the: the boy = Ø ləRka. But when a main clause is followed by a restrictive relative, then the definite distant determiner must precede the referent noun in the main clause. As this determiner is vəh, the same as the third person pronoun referred to above, one step in the relativization process in Hindi can be considered as simply deleting the noun in ə sentence-final main clause and leaving the determiner behind as a marker, rather than substituting a pronoun for the deleted noun. This is probably a simpler set of rules and would represent greater economy for the speaker.

Some of these properties just discussed are illustrated in the following sentences:

(14a) ram ne, jo əmiir hai, ek məkan khəriida
Raam who rich is a house bought
'Ram , who is rich, bought a house.

(14b) *ram ne ek məkan khəriida jo ə miir hai (constrainedness of A-positioning)
'Raam bought a house, he is rich.'

*jo ram əmiir hai us ne ek məkan khəriida
Whi
'Which Raam is rich, he bought a house.' (All right if disjunctive; i.e. if talking about more than one person named Raam.) The English equivalents are approximations.)

(14c) us admii ne jo əmiir hai ek məkan khəriida (freedom of movement of R's)

'that' 'man'

'The man who is rich bought a house.'

jo admii əmiir hai us ne ek məkan khəriida

'Which man is rich, he bought a house.'

us admii ne ek məkan khəriida jo əmiir hai

'The man bought a house, who is rich.'

(14d) vəh kəhanii bəhut dilcəsp thii jo kəhanii us ne kəhii thii

'that' 'story' 'very' 'interesting' 'was' 'which' 'he' 'told'

'The story which he told was very interesting.'

jo kəhanii usne kəhii thii vəh kəhanii bəhut dilcəsp thii

'Which story he told, it was very interesting.'

(obligatory deletion of identical NP from second clause)

As the English equivalents demonstrate, this kind of clause movement is impposible in general in English, although with restrictive relatives occurring in sentences containing intransitive verbs, such extraposition of a restrictive relative is sometimes possible:

(15a) A boy came to the party who was short. (* for some speakers)

As in Hindi, such extraposition is totally impossible with an appositive relative:

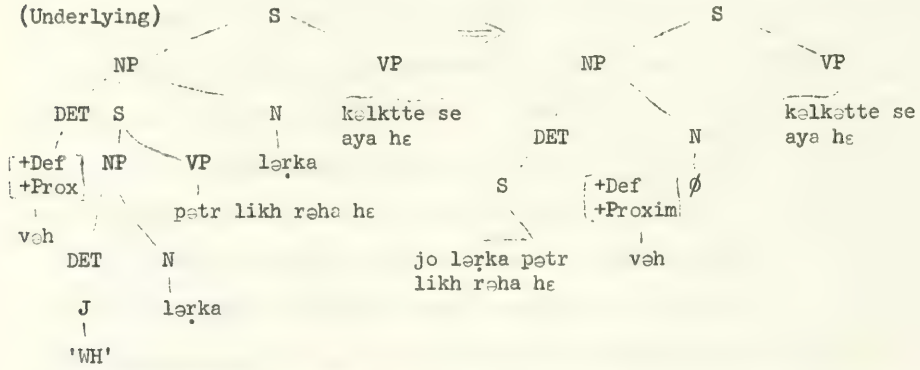
(15b) *Bill came to the party, who was short.

In their analyses of the Hindi relative clause, both Yamuna Kachru

and Manindra Verma adopt the embedded source position, although they employ differenc mechanisms for the generation of relatives. Mrs. Kachru (1966) treats the relative clause as an optional expansion of the NP, which is later embedded as the left daughter of the determiner for the modified noun. She writes (1966:99),

> The process of generating a complex sentence with a relative clause is as follows:
> (i) Permute the Def. DET of the Matrix S with the Embedded S,
> (ii) Delete the repeated N

She illustrates the effect of these two processes with the following trees:




As we mentioned above, it is not just permutation of the determiner and relative that is involved, but rather daughter adjunction of the relative to the determiner. These processes result in the relative clauses' preceding the main clause, which Mrs. Kachru considers the basic order. Thus, when the noun is in subject position in the main clause, the unmarked order is relative clause, then main clause. When, however, the modified noun occurs in object position Mrs. Kachru has claimed that there is obligatory topicalization of the main clause, moving it to

sentence-initial position; and when the modified noun is a postpositional object, topicalization of the main clause. Additionally, if the noun modified is preceded by an indefinite determiner, the relative clause extraposes beyond the main clause. A relative can also be reduced, to yield participles and adjectives. In this case, the reducad relative will precede the modified NP, and the rest of the sentence will not be disturbed (Kachru 1970: October 29). In (Kachru 1966), too, it is emphasized that while relatives modifying subject nouns naturally occur sentence-initially, they frequently do not elsewhere. Thus, we read, 'Notice that when the modified N is not the subject N, the relative clause does not precede the modified N; rather it follows the Matrix S', and again, this time concerning the derivation of adjectives from embedded relatives, 'If, however, the relative clause, though containing an AP, is not reduced, it is moved to the end of the sentence' (Kachru 1966: 101, 103). (In the example given for the latter case, incidentally, us ne ek bəhut bəɾ jhīl dekhī / us ne ek jhīl dekhi jo bəhut bəɾī thī, the unreduced relative would extrapose, anyway, because of the indefinite article ek preceding the modified noun.)

In contrast, Verma introduces the relative clause as itself a part of the determinate categroy in deep structure. His prhase-structure rules accounting for this are

HB1[3] NP → Proper name + (A)
D + Noun
(#S#)

HB2 D → (wh) + Determinate
Indeterminate

HB6 Determinate → { Quantifier / Limiter } + { Deictic / Anaphoric / Cataphoric } + (Quantifier) + (Aggregative)

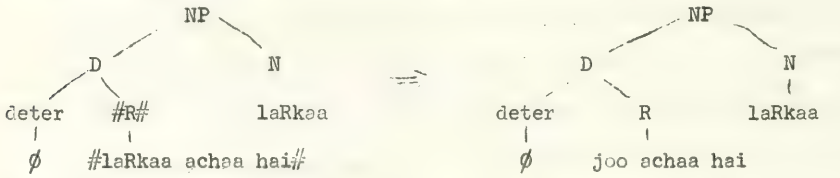
HB7 Deictic → Def + Demon + (A)

HB8 Demon → { Demon$_1$ / Demon$_2$ }

HB9 Anaphoric → Def + (Demon) + (R) + (A)

HB10 Cataphoric → Def + Demon$_2$ + R + (A) (Verma 1966:99).

The Demon$_1$/Demon$_2$ distinction is that of proximate/distant, i.e. y-h/v-h. Verma treats the main clause as basically coming first, as his formulation of the relativization rule demonstrates. This transformation 'adds the element j- and deletes the first NP of the embedded string just in case the condition of non-distinctness is met' (1966:138). Thus, with its occurrence of the shared NP deleted, the relative clause must necessarily extrapose, as we have already noted that the first clause in a sentence must contain the modified NP. Verma's trees show the effect of his relativization transformation:




Note that he specifies that it is the first NP of the embedded relative that deletes under condition of identity with a noun in the main clause. If the embedded R's expand by the normal rules of S-generation, then problems are going to arise when the identical NP is in a position other than the initial one in the embedded clause, e.g. when it is a direct object.

If Verma wishes to retain the notion of deleting the first NP of the embedded string, then he has two options. First, he can set up special rules of R-generation to specify that the identical noun will somehow get generated in clause-initial position, an expensive and intuitively wrong move, or he can have a transformational rule applying before relativization which would move the identical NP to clause-initial position, from which it could then delete. But, again, this is expensive, as it involves an unnecessary move. As soon as the noun has been identified as having the same reference as a noun in the other clause, then it might as well be deleted, so long as that deletion is what is desired. Verma desires this deletion to account for getting adjectives:

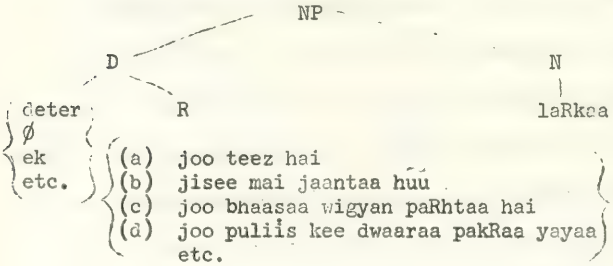
> If there is no further deletion, the relative clause moves to the post-noun head position. In case of further dleltion, or in case the noun head, and not the identical NP of the embedded sentence, is optionally deleted, the embedded string stays put (Verma 1966·138).

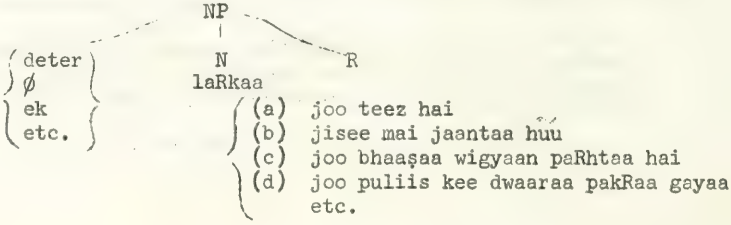
Notice that it is suddenly possible for the noun head to optionally delete, whereas no provision was made for this earlier. We are not told what the conditions are on this optional deletion of the head noun, i.e. the modified noun, from the main clause, so it is difficult to tell how normal Verma would consider this to be. Rather strangely, in an earlier passage Verma implies that a sentence-initial relative is both the normal case and that it is the normal expectation only for generics:

> For neutral (i.e., non-emphatic) meaning, the general tendency in Hindi is to prepose the relative clause to the embedding noun phrase (with some minor changes) which yields constructions like
>
> (26) joo loog sooyee kuttoo koo cheeRtee hai woo ...

['which people kick sleeping dogs, they ...]
It is more so in the case of the generic implication of this construction (1866:105).

If nonemphatics are the general case, and I would think they would be, and if in cases of nonemphatic meaning it is most common to have a sentence-initial, rather than a sentence-final, relative clause, then it seems counter-intuitive to postulate a rule that in most instances deletes the occurrence of the referential noun from the underlying relative clause and thus necessitates its moving from sentence-initial position. Nonetheless, as we have seen, this is what Verma does. In speaking of deriving adjectives from embedded relatives, he again emphasizes the movement of relative clauses to a position after the noun head: 'In case there is no deletion the whole embedded relative clause obligatorily moves to the postnominal posttion' (1966:190). He then gives trees that demonstrate this movement in operation:



Note that in example (b) the deleted noun has been the direct object, which would normally have occurred after the subject, mãi; yet it has still been deleted, presumably by Verma's first-noun-of-embedded-string deletion rule. Note, in addition, from example (b) that case-marking changes have already applied in the deep structure, soemthing taken care of in standard theory by rather late morphophonemic rules.

## III. This Study

### A Purpose

Because both Kachru and Verma emphasize the general nonoccurrence of sentence-initial relative clauses, except in cases of subject NP modification or generic meaning, and because I had noted examples of grammatical sentences beginning with a relative modifying the main clause object noun, one of the things I wanted to explore in this study was whether or not this could regularly be done. Another purpose of my study was to test the effect on acceptability and meaning of moving the relative pronoun and the modified noun (or the relative determiner + noun and the remaining demonstrative from the main clause, in the case of sentences beginning with relative clauses) to different positions within their clauses.

### B. Method

In order to accomplish the first goal it was necessary to have the relative clauses modifying nouns in different cases and constructions. The ones I decided to examine were subject, direct object, indirect object, postpositional object (under this category I included adverbial

expressions of time and place), and possessives; and I chose also to see what happened when the corresponding noun in the relative clause was in these constructions, too. Because the transitive/intransitive verb distinction would also play a role (i.e. with direct and indirect objects), this became another variable (in the category of intransitive verbs I included the copula, along with 'normal' intransitives such as ana 'to come'). The following matrices describe the situations set up in my sentences:

| | | $S_2$ (-ne) | | |
|---|---|---|---|---|
| | | Subj. | PPO | Poss. |
| $S_1$ (-ne) | Subject (Subj.) | 1 | 2 | 3 |
| | Postpositional Object (PPO) | 4 | 5a,b | 6 |
| | Possessive (Poss.) | 7 | 8 | 9 |

| | | $S_2$ (-ne) | | |
|---|---|---|---|---|
| | | Subj. | PPO | Poss. |
| $S_1$ (+ne) | Subj. | 10 | 00 | 12 |
| | Direct Obj.(DO) | 13 | 14 | 15 |
| | Indirect Obj.(IO) | 16 | 17 | 18 |
| | PPO | 19 | 20 | 21 |
| | Poss. | 22 | 23 | 24 |

| | | $S_2$ (+ne) |
|---|---|---|
| | | Subj. |
| $S_1$ (-ne) | Subj. | 25 |
| | PPO | 26 |
| | Poss. | 27 |

| | | $S_2$ (+ne) | | |
|---|---|---|---|---|
| | | Subj. | DO | Poss. |
| $S_1$ | Subj. | | 28 | 29 |
| (+ne) | DO | 30 | 31 | |

The (+ ne) representation above stands for the transitive/ intransitive verb distinction; $S_1$ and $S_2$ are the main and relative clauses, respectively; and the numbers are simply the numbers assigned to the sentences that show these configurations. Thus, in sentence 14, for example, the shared noun is the direct object of the main clause and the postpositional object of the relative clause. In addition, I considered one sentence having milna 'to meet' as the verb in both clauses, since it behaves a bit strangely, in that while it is a transitive verb, its subject does not take ne in the past tense, and its object is marked with se. As is obvious from the sparseness of the matrices, there are many combinations that I didn't try; and the study is therefore incomplete. The main reason for this failure was chiefly time limitations; but as it was the question of what happens with relatives modifying different cases in the main clauses that had stimulated the study, trying out all possible cases in the relative clause did not seem strictly necessary. Additionally, the behavior was similar enough that I felt there was little need for more material.

In addition to relativizing nouns of different cases, variables of positioning, both of the clause consittuents, and of the clauses themselves, also had to be considered. At first I randomly moved elements

around within their clauses; and then, ralizing that I was going to need a system if I were to be able to make any generalizations about what was happening, I set up the following ordering patterns. First, I rather arbitrarily decided that the following would constitute the unmarked order of constituents in a clause: [(Adv.)--Subj.--(IO)--(DO)--(Pphrase)--Verb]. Then using this, I planned to form my sentences following eight basic patterns:

(1) [U order]$_{S_1}$ [J-initial]$_{S_2}$ (J = the relative pronoun

(2) [U order]$_{S_1}$ [U order (i.e. with J-element in natural position]$_{S_2}$

(3) [Referent initial]$_{S_1}$ [U order]$_{S_2}$

(4) [Ref.-initial]$_{S_1}$ [U order]$_{S_2}$

(5) [J-initial]$_{S}$ [U order]$_{S_2}$

(6) [J-initial]$_{S_2}$ [Ref.-initial]$_{S_1}$

(7) [U order]$_{S_2}$ [U order]$_{S_1}$

(8) [U order]$_{S_2}$ [Ref.-initial]$_{S_1}$

Thus, there were four sentences with the relative clause following the main clause (1-4) and four with it sentence-initial (5-8). Because in some cases the relative pronoun would naturally fall in clause-initial position, all sentences do not actually have eight variants, however. Once the sentences were constructed, I met with Vimala Mohan, my informant, who then commented on the degree of acceptability of the sentences and on any meaning shifts that occurred. The actual sentences, along with their evaluations, are included in an appendix at the end of the paper. (It should be noted that although an optional adverb was stated as coming

first in the unmarked order, this is not strictly the case; in normal Hindi sentences the subject would usually come first. However, adverbs prepose easily enough in Hindi that this could be used as a test consition for whether or not jo had to be clause-initial when it was in the subject position in the relative clause. Adverbs can usually front, and we might expect this to happen with relatives, too.)

C. Findings

1. Movement of clauses

Judgments about the acceptability of sentences have been compiled in the table on the following page. As all of the patterns for each sentence were not given a strict rating, the table does not contain ratings for every pattern or every sentence. Only if a pattern was specifically stated to be in one of the categories, best, good, acceptable, or bad, did I place it there on the table. This should be kept in mind when considering findings from the study.

In eight cases sentence patterns with initial relative clauses were considered best; thirteen times main clause-initial patterns were preferred. On occasion Mrs. Mohan's judment on sentences would fluctuate; and I had the feeling that at times she may have been influenced by the English grammar, or by school-grammar imperatives. For example, when given the patterns in sentence (1), her first reaction was that pattern 1, with main clause first, was acceptable, and patterns 5 and 7, with relative clause initial, were better. On reflection, though, she decided that all three were equally good. In cases of such fluctuation, I have

| | DEGREE OF ACCEPTABILITY | | | |
|---|---|---|---|---|
| | Best | Good | Acceptable | Bad |
| 1 | 6, 7, 9, 10, 13, 14, 15, 16, 19, 21 | 1, 3, 8, 26, 28, 31, 32(*mil-na* S) | 11 | 17 |
| 2 | | | 11, 13(?), 15, 16, 21 | 1, 3, 4, 7, 9, 10, 17, 28, 29 |
| 3 | 12, 18, 41 | 15, 26, 28, 31, 32 | 4, 13, 16, 17, 21 | 1, 9 |
| 4 | | | 13(?), 15, 16, 17, 21 | 1, 4, 5a, 9, 26, 28 |
| 5 | 4, 16, 17, 18 | 1, 2, 3, 6, 99, 10, 11, 14, 21, 26, 28, 30, 31, 32 | 13, 15 | |
| 6 | 5a, 23, 24 | 5b, 12, 14, 19, 20, 21, 26, 31, 32 | 4, 13, 15, 16, 17 | 1 |
| 7 | 8 | 1, 2, 5b, 7, 10, 11 | 4, 5a, 13, 15, 16, 17, 21 | 3, 18, 28 |
| 8 | | 5b, 29 | 4, 5a, 13, 15, 16, 17, 21 | 1, 18, 28 |

TABLE. Evaluation of sentence patterns. Numbers represent the corresponding sentences.

used the final choice as being decisive; perhaps reliance on first impressions would have been more valid. When the relative clause first structure was preferred, it was frequently for reasons of clarity. For example, with its main clause first, sentence (5a) is ambiguous:

(5a-1)gay səRək pər cəlii ja rəhii thii jis pər log baiThe the
'cow' 'street' 'on' 'is going' 'which' 'on' 'people' 'are sitting'
'The cow is walking on the street on which the people are sitting'o
'The cow on which the people are sitting is walking on the street.'

But this ambiguity is resolved when the relative clause is sentence-initial because then the modified noun is necessarily specified in the relative clause, as the noun must be mentioned in the first clause of the sentence:

(5a-6) jis səRək pər log baiThe the us pər gay cəlii ja rəhii thii
'which' 'street' 'on' 'people' 'are sitting' 'it' 'on' 'cow'
'is going'
'The cow is walking in the street on which the people are sitting.'

Thus, if ambiguity arises because it is unclear which noun is being modified by the relative clause, having the clause in initial position will immediately clarify the situation.

Linked with the matter of clarity in S-initial relative clauses is their whole role in disjunction, in uiiquely determining the identity of the noun to which they refer. Beginning the sentence with the restrictive relative thus establishes the identity of the referent before the main clause is begun, so that the audience knows from the beginning just

who or what is going to be talked about. Even though the main clause is the real message the speaker wants to get across, it sometimes helps to establish the identity of the reference first, so that the intent of the assertive main clause will be immediately obvious. If, on the other hand, the main clause is given first, its impact may be weakened as the listener shifts his attention to determining just who or what the subject is. For example, the preferred version of sentence (24) is

(24-6) jis lərkii kii shadii pichle həfte huii thii

'which' 'girl's' 'wedding' 'last' 'week' 'occurred'

us ke pita ne is duukan se phuul khəriide

'her' 'father' 'this' 'shop' 'from' 'flowers' 'bought'

'The father of the girl who got married last week bought the flowers form this shop.'

for which the English equivalent would be something like

(24-6a) 'You know the girl who got married last week?--well, her father bought the flowers from this shop.'

This leads us to another observation about beginning sentences with restrictive relatives. This structure tends to set the theme of the sentence, to state in advance what is important. In sentence (4), for instance, both of the following patterns are grammatical:

(4-1) pəkshii peR pər baiTha tha jo nədii ke kinare pər tha

'bird 'tree' 'on' 'was sitting' 'which' 'river's'bank' 'on' 'was'

(4-6) jo peR nədii ke kinare pər tha us pər pəkshii baiTha tha

'which' 'tree' 'river's''bank' 'on' 'was' 'it' 'on' 'bird' 'was sitting'

'The bird was sitting on the tree which was on the riverbank.'

In the second the tree was felt to be the most important part of the sentence, while the first stressed the bird, the subject of the main clause. Thus, the attention of the listener shifts, according to what comes first in the sentence. His mental set and perspective seem to--well, perhaps not be fully determined by this, but at least be influenced by it.

Sentences with initial R relatives were not always considered best, though. There were those patterns about which there was said to be hardly any difference in either acceptability or meaning (e.g. hæm ne vəh kursii dekhii jis pər washingTən baiThe the 'We saw the chair on which Washington had sat'/ jis kursii pər WashingTən baiThe the hæm ne vəh dekhii 'Which chair Washington had sat on, we saw it'). Moreover, there were those sentences for which the preferred pattern was with main clause first. Sentences (7), (15), and (21) were all said to be clearest when begun with their main clauses. All of these contained a possessive; in (7) in the main clause; in (15) and (21) in the relative. But as other sentences with possessives did not display such preference, I doubt that there is a valid generality here. Of these I will reproduce only sentence (7) here:

(7-1) us kisan ka paisa gayəb ho gəya jo shəhər mẽ baukhəla gəya

'that' 'peasant's' 'money' 'disappeared' 'who' 'city' 'in' 'became confused'

'The money of the peasant who became confused in the city disappeared.'

(7-5) jo kisan shəhər mẽ baukhəla gəya uska paisa gayəb ho gəya

'Which peasant became confused in the city, his money disappeared.'

(This sentence was one of those in which the theme was affected by an introductory relative clause: the emphasis was given to the peasant, rather than to the disappearance of his money when the relative occurred first.)

The crucial matter to note, however, is that although sentence-initial relatives were not always preferred, they were never considered ungrammatical. Whether the referent noun in the main clause is the subject, direct object, indirect object, postpositional object, or a possessive, still it is acceptable to use a restrictive relative to begin the sentence.

2. Movement of constituents within clauses

The issue of most interest concerning constituent movement within the clauses themselves was the effect, if any, of moving the relative pronoun, jo, and the corresponding demonstrative in the main clause, vəh, from the position the nouns they replace would normally occupy in their clauses to clause-initial position. Or perhaps this is better stated in reverse order: the effect, if any, of moving jo and vəh from clause-initial position to the natural position in their clauses, as the pattern of pronoun first, the rest of the clause following is that used for teaching relative clause formation--to nonnative speakers, at least. That is, if the relative clause follows the main clause, students are taught to begin the relative clause with jo, referring to the shared noun; and if the main clause follows the relative, students are taught to begin it with the demonstrative reference to the shared noun. In

initial position the relative clause again is to begin with the relative pronoun; but I do not recall ever having been instructed that the first NP in an initial main clause must be the referent noun.

The findings from my sentences show that the most natural shapes for the clauses are indeed those with the jo and vəh in the initial positions of their respective clauses. Looking at the data of the table, and comparing them with the sentence patterns given on page 28, we notice, for example, that patterns 2 and 4, in which in a sentence-final relative clause the relative pronoun occurred in natural, rather than initial position, were never considered either best or good, although they were sometimes acceptable. Moreover, these two patterns were those most frequently considered bad. In patterns 7 and 8, when the relative clause occurred at the beginning of the sentence, there was greater flexibility, and other constituents could precede the relative + NP more easily. In sentence 8, even, while all patterns were considered acceptable, pattern 7 was chosen first as being a good sentence:

(8-7) ram jis məkan mẽ rəhəta hai uskii bəttiyã̃ jəgəməga rəhii thii
'Ram' 'which' 'house' 'in' 'lives' 'its' 'lights' 'were glimmering
'Which house Ram lives in, its lights were glimmering.'

This shows that while fronting of the relative pronoun may be preferred in most instances, it is not crucial.

There are fewer constraints, too, on the demonstrative pronoun than on the relative. Thus, patterns 5 and 6, which differed only in that in 5 the demonstrative occurred in its natural position while in 6 it was fronted, were considered grammatical an almost equal number of

times. When the main clause was sentence-initial, however, there was a definite preference for having the referent noun be clause-initial. Pattern 1, which expresses this configuration, was the pattern most frequently chosen as best.

The constraint on placement of the jo and vəh seems to be more a matter of not occurring directly before the verb than of necessarily being clause-initial. For example, sentence(10-2), with jo just before the verb in the second clause, and sentence (1-8), with vəh immediately preceding the verb, were both rejected:

(10-2) *məriiz ne dəva pii əspətal mẽ rəviwar se jo tha.

'patient' 'medicine' 'drank' 'hospital' 'in' 'Sunday' 'since' 'who' 'had been'

'The patient who had been in the hospital since Sunday drank the medicine.'

(1-8) *mere pas jo ləRka rəhta hai mera choTa bhaii vəh hai

'near to me' 'which' 'boy' 'lives' 'my' 'little 'brother' 'is'

'Which boy lives with me, he is my little borther.'

So long as a postposition or other element intervenes between the pronoun and the verb, however, the sentences seem to be all right, e.g.

(4-5) jo peR nədii ke kinare tha pəkshii us pər baiTha tha.

'which' 'tree' 'river's' 'bank' 'was' 'bird' 'it' 'on' 'was sitting'

'Which tree was on the riverbank, the bird was sitting on it.'

Recall that we noted that if the main clause comes first in a sentence, there is a preference for placing the shared noun in clause-initial (and, thus, sentence-initial) position. In case a reference can be ambiguous,

as in the case of sentence (5a-1) (see p. 31), the relative clause is most usually interpreted as referring to the first NP in the main clause. As an additional example of this sort of ambiguity, consider sentence (12-1).

(12-1) dhobii ko us duukandar ne galii di jis kii beTii/merii sahelii hai

'washerman' 'to' 'that' 'merchant' 'insult' 'gave' 'whose' 'daughter' 'my' 'friend' 'is'

'The merchant whose daughter is my friend insulted the washerman.'

When I constructed this sentence, I intended for it to have the meaning given in the gloss. However, Mrs. Mohan told me that this was a forced reading, that the daughter was naturally interpreted as being the washerman's--despite the fact the dhobii 'washerman' has no demonstrative occurring before it, while us 'that' precedes duukandar 'merchant', a circumstance which, considering the link between demonstratives and the relative, we would expect to condition the intended interpretation.

Since relatives usually apply to the first NP of the S, I was initially surprised that in sentence (26-1) the relative clause could not be interpreted as applying to Ram:

(26-11) ram us admii ke sath bazar gəya jis ne apnii pətnii ke

'Ram' 'that' 'man' 'with' 'bazaar' 'went' 'w o' 'his own' 'wi '

liye ek saRii khəriidii

'for' 'one' 'sari' 'bought'

'Ram went to the bazaar with the man who bought a sari for his wife.'

*'Ram, who bought a sari for his wife, went to the bazaar with the man.'

This, however, is due to the constraint we earlier noted on appositive

'which' 'peasant's' 'money' 'was stolen' 'him' 'about' 'I' 'heard'

'Which peasant's money was stolen, I heard about him.'

While the above is one of the readings for the sentence, I learned that the us of the main clause can also be interpreted as 'it', in addition to 'him', thus meaning that the reference is to the whole incident expressed by the preceding relative clause.

When constructing them, I had anticipated that sentences I made up with a possessive shape NP ka NP in the main clause would also be ambiguous, as there would be two nouns to which the relative clause could refer. For example, I expected that there would be two readings for (22-1), one in which the girl was interpreted as having come, and one in which it was the sister who had come.

(22-1) us lɛRkii kii bəhən am kha rəhii hai jo kəl yəhã **aii.**

'that' 'girl's ' 'sister' 'mango' 'is eating' 'who' yesterday' 'here' 'came'

'The sister of the girl who came here yesterday is eating the mango.'

*The girl's sister, who came here yesterday, is eating the mango.'

But in actuality there is just the single interpretation with the relative attaching to the possessor noun. At first this may seem puzzling, as in sentence (12-1) the interpretation linking the relative with the second-occurring noun could at least be forced. Besides this, in English the whole process of referring in a relative clause to a possessive noun is a bit awkward: the possession has to be expressed by the NP of NP construction, rather than the simpler -'s marker (both *the girl's who came here yesterday sister and *the girl's sister who came here yesterday are ungrammatical if the relative is to refer to the girl). Thus, if anything, I would have expected that the natural reading would be to refer

the possessed NP with the relative clause. That this does not happen, though, is fairly easily explainable, since, as with Ram in sentence (26-1), the possessed NP is considered specific; and the preceding NP-ka is read as a definite determiner. Thus, any relative referring to the possessed NP would be appositive, rather than restrictive, and could only occur immediately after the modified noun. If in the above sentence the relative clause is to be interpreted as referring to bəhən 'sister', then bəhən must be preceded by the demonstrative vəh, signalling that it is in a cataphoric expression and that a restrictive relative is following.

D. Theoretical implications

Note from the table that while the main clause-first construction was considered best in thirteen cases and the jo-clause-first best in eight, the initial relative clause ranked in the 'good' category thirty-one times, while the initial main clause formation was judged to be 'good' in only thirteen cases. In terms of numbers alone, these figures can support Kachru's claim versus that of Verma, I think, that sentence-initial position for the relative is basic. Moreover, recall that we found that no matter what case the modified noun happened to be in, it was never ungrammatical to begin the sentence with a relative clause in reference to it. This suggests that whatever sort of rule one has for moving the relative clause (or the main clause) to another position in the sentence, it must be optional, rather than obligatory.

Notice that in the preceding sentence I used the phrase 'whatever

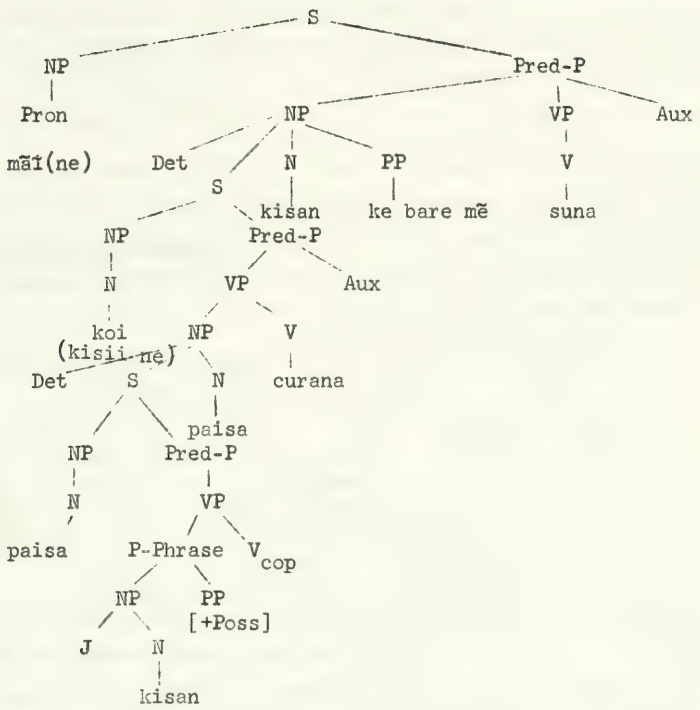
sort of rule one has', rather than saying that the rule for either extraposing the relative or for topicalizing the main clause must be optional. This is because while the figures support a relative clause-initial analysis, I do not feel that such an interpretation is always necessary. In particular, I feel the conjunctive source analysis has more to offer than one which derives the relative clause from a position embedded beneath a matrix S. In the sentences we have examined there is a strong piece of evidence for this. Recall that in sentence (20-6) the us of the sentence-final main clause can refer either to the peasant or to the incident:

(20-6) jis kisan ka paisa curaya gəya tha us ke bare mẽ mai ne suna

'Which peasant's money was stolen, I heard about $\begin{matrix}\text{him}\\\text{it}\end{matrix}$.'

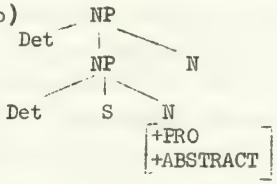
Under the embedding analysis, however, such ambiguity cannot be accounted for; there is no way for the demonstrative to refer to the whole of the relative clause; its reference can only be to the peasant. Let us see why this would be so by examining a hypothetical tree structure for the sentence.

(20-6a)



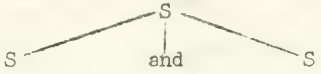

In order for the S to be pronominalized, it would need to be the daughter of a higher NP, ie. to be in an it-S structure. But is is hard to see how the rules could allow for any such higher abstract NP, when the relative is already considered a sister of the noun it is modifying. The postulated structure would look something like (20-6b), I suppose:

(20-6b)



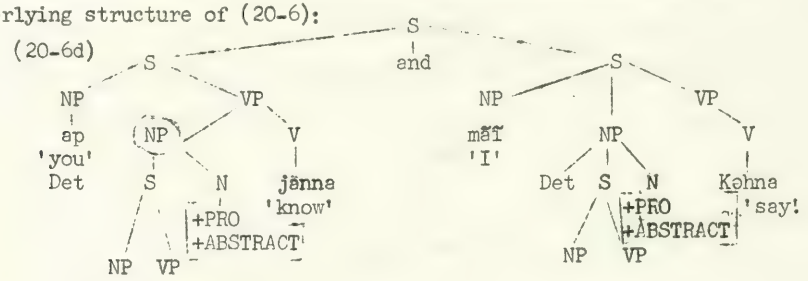
So how, one might ask, does a conjunctive source analysis solve the problem? Even if the source is like that of (20-6c), there is still no higher NP to pronominalize.

(20-6c)




This is true--but the performative analysis saves the day. The performative analysis involves the claim that above every declarative sentence there is a structure having a form like I declare to you that S. Consider, then, the following tree as a possible candidate for the underlying structure of (20-6):

(20-6d)




In this tree the left S represents the structure that would become a relative clause, the right S that which would become the sentence's main clause. The circled NP above the relative clause's S is that which could be pronominalized and referred to as us 'it' in the main clause. The reader may have noticed that while this was supposedly a performative analysis, the matrix S for the restrictive relative is not I declare NP but you know NP. This is no more than an approximation, and there may be another occurrence of I declare above the you know NP sentence (there probably is, in fact, if our intuitions about the meaning of this can be trusted). What I wished to capture with this structure, though, is the observation that what is contained in a restrictive relative is the speaker's presuppositions about the knowledge on the part of his audience. The main clause, on the other hand, can be seen to be in the form of an assertion. Something like this was suggested to me by Michael Geis, who wrote in a paper comment to me (January 1971):

> ... if in $S_1$ and $S_2$ (a) $S_1$ is presupposed and $S_2$ is asserted,

then $S_1$ is subordinate, (b) $S_1$ and $S_2$ are both asserted, we get an appositive relative or two conjoined S's.

Appositives and full sentences could then be distinguished by something like Postal's [± Main] markings. If such a view is accepted, there is then no need for ordering either sentence first in underlying structure. Whichever occurred first underlyingly could occur first also in surface structure--which is why I have tried, in general, to avoid using the terms preposing and extraposing in this paper as these would claim that one order were definitely the underlying one. Unfortunately, letting the underlying order be either way would argue that sentences identical except for the position of the relative clause would be unrelated--which I do not believe. But neither can I see strict reasons why it should not be possible for a presupposition to underlyingly occur in either the left or the right position.

If such an analysis is correct, then how can the link of relatives with determiners be accounted for, since relatives would no longer be either daughter or sister adjoined to the determiner? One possible way might be to suppose that the distant demonstrative is obligatorily generated by the P-S rules and then deleted in case its NP is specific in reference. Cases of proper and possessed nouns, etc. that appear normally to be fully specified, but which do take the demonstrative and a following restrictive relative if they need more definite specification, would support such a view (for such an opinion about English determiners see Postal n.d.:29).

What can we now determine from evidence we have seen regarding

movement of jo and vəh within their clauses? Note, first of all, that the relative clause-initial structure apparently allows greater freedom of movement than does the sentence-final relative structure. To illustrate this, we shall look at the judgments on sentence patterns 7 and 8, which were relative clause-initial, but with the relative pronoun occurring within the clause, not clause-initial. Pattern 7 was considered the best pattern for one sentence and was considered 'good' six times; 8 was 'good' twice. Both were acceptable seven times and specifically bad only three times. Contrast this with the situation when the jo-clause was sentence-final. Patterns 2 and 4, in which the jo-element occurs in 'natural' position in its clause, were never considered best--or even 'good'. Both were judged acceptable four times, marginally acceptable once (S(13)). And 2 was considered bad nine times; 4, six times. In general, these 'bad' sentences displayed the jo-element occurring just before the verb.

If these are valid data, they would argue that if there is a rule in the grammar that positions the relative clause, rather than its arising from either the left or the right underlyingly, then any fronting rule for the relative pronoun must occur in the grammar after the clause-positioning rule. The greater freedom of movement in S-initial relative clauses would suggest that the environment of the clause's position be built into a jo-fronting rule, making it optional if the clause were S-initial and obligatory if it were S-final. However, this cannot be correct, as we have acceptable sentences with the jo-element not clause-

initial when the relative clause is sentence-final. Therefore, the rule could not be obligatory.

Examination and comparison of the sentences themselves indicates that the crucial matter may instead be the occurrence of the shared noun with the determiner-pronoun. Thus, when the jo-clause is S-initial, the J-noun structure will automatically occur, preventing jo-Verb co-occurrences. In the sentences from my data the demonstrative pronoun for the shared noun in the sentences that were acceptable in patterns 7 and 8, but not in patterns 2 and 4, was frequently associated with a postposition and thus also would not occur immediately before the verb. If the pronoun were the relative and not the demonstrative, though, the sentences were sometimes bad even when a postposition intervened between the pronoun and the verb:

e.g. (5a-4) *sɔRɔk pər gay cəlii jaa rəhii thii log jis pər baiThe r the.

'street' 'on' 'cow' 'is going' 'people' 'which' 'on' 'are sitting'

Besides this, sentences with vɛh just before the verb were sometimes acceptable; consider (13-8):

(13-8) mez pər jo kele the həm ne ve khaye

'table' 'on' 'which' 'bananas' 'were' 'we' 'them''ate'

'We ate the bananas which were on the table.'

These observations suggest a number of proposals. First, any fronting rule seems to be concerned more with jo than with vɛh. Secondly, we have noted that the constraint seems to be on preventing immediately preverbal occurrences of the relative pronoun, rather than on guarantee-

ing that it be clause-initial. As deletion of the identical noun from the second clause could bring about such a co-occurrence, we might order the fronting rule after that which deletes the identical noun from its occurrence in the second clause. If the demonstrative determiner is generated automatically before all nouns by the P-S rules, then before EQUI-NP deletion takes place, we will need a mechanism to look at the clauses' structures for whether or not they are assertive or presuppositions. If a clause is marked [-Main], and contains an NP identical to one in the other clause, then there will be a rule converting vəh to jo before deletion of the second-occurring noun. If there is a rule for positioning the relative clause within the sentence, rather than its surfacing from its underlying position, this will be an optional rule, and EQUI-NP deletion will occur after it. The deletion rule will simply look at the linear order and delete the second of two identical NP's, leaving behind the determiner as a pronominal marker.

In the rule determining the position of the relative pronoun in its clause what we want to state is that if jo plus an optional postposition is seen to occur just before a verb, then it is moved to the left over a variable. To accomplish this I propose the following tentative rule

SD: $[_S$ X--Y--jo (PP)--Z--$V_S]$

1 2 3 4 5

SC: 1 3 2 4 5

Cond.: If Z is $\emptyset$, rule is obligatory; otherwise, optional.

Since X can be null, this can yield clause-initial position, as well as others in the clause. Such a movement rule allows for the NP shared with the main clause to be generated in its natural position by the P-S rules, rather than being arbitrarily moved to the beginning of the relative clause or for the jo to be inserted at the beginning of the clause.

IV. Conclusion

While much remains inconclusive about generalizations to be gained from this study, I think we have seen our basic premise hold true, that word order in Hindi is more restricted than in a thoroughly inflective language, but at the same time more free than in a language which determines syntactic relationships solely from word order. This greater freedom is exercised by the speaker in his choice of position with the S for the relative clause, and in his choice of position within the clause for the relative pronoun. The former ability point to the role of the speaker's own purpose in uttering the sentence: he can choose to specify the reference first, and then make an assertion about the thing referred to; he can begin to make the assertion, interrupt himself to clarify the reference, and then complete his assertion; or he can first make the assertion and then clarify the reference. The second ability pointed out, together with the prohibition of preverbal occurrences of the relative pronoun, has led me to believe in a rule of relative pronoun movement that can transplant the relative pronoun from the position in which it is generated by the P-S rules to elsewhere within its clause. Moreover,

it seems more profitable to think of these as having their source in a conjoined structure than in an embedded one. Thus, if two clauses share a noun phrase, and both are assertions, then one of two constructions can occur. Either we can get a conjoined sentence, with obligatory pronominalization in the second clause (e.g. us lərke ne nau bəje kutte ko dekha tha, aur dəs bəje us ne billii ko dekha 'The boy had seen the dog at nine o'clock, and he saw the cat at ten o'clock.), or one of the clauses can become an appositive relative and be swooped under its referential noun with subsequent deletion of the shared noun (e.g. us lərke ne jisne nau bəje kutte ko dekha tha, dəs bəje billii ko dekha 'The boy, who had seen the dog at nine o'clock, saw the cat at ten'--the boy is here anaphoric to some previous mention in the discourse). If, on the other hand, only one of two conjoined sentences sharing a noun is assertive and the other is a presupposition, then the result is a main clause with an attached restrictive relative. It would be most economical to say that one order of these clauses is basic and the other derived; but at this time I would hesitate to say that either the asserted clause or the presupposed one must necessarily precede the other in underlying order. On intuition we might choose to say that the presupposed clause comes first, simply as this is known to the speaker to be 'old knowledge' that is shared between him and the listener, whereas the assertion will contain new information. However, if we have no direct evidence and are only relying on hypotheses, we could also suppose that the assertion precedes, to be followed by the clause that will be-

come a defining restrictive relative, when the speaker realizes that his listener will need more information in addition to what is contained in the assertion. Obviously, this way lies nothing conclusive. While we have seen that in a number of cases the relative-initial position is preferred for reasons of clarity, there are other cases where main clause-first order is preferred, and, additionally, when either seems equally acceptable. Were one more obviously preferred to the other, then the choice would be clear: choose that order as basic and derive the other from it, as this will involve the speaker in the least number of steps more of the time. Then the preferred order would become the unmarked case, the less natural order the marked case. Perhaps with a larger corpus, from actual spoken texts, rather than artificially constructed examples, one order would be definitely preferred. However, as my data have not shown this conclusively to be the case, I will simply assume that the grammar contains the necessary mechanism for moving the clause containing the presupposition to either sentence-initial or post-main clause position from wherever it arises, and that this movement can be vacuous in case the underlying order is that of the surface manifestation.

## NOTES

[1]I am indebted to a number of people for their help with this essay. First, I owe an inexpressible amount of gratitude to my advisor, Yamuna Kachru, for having suggested the topic, and for her encouragement, interest, and trust as I worked with it. Secondly, I acknowledge my thanks to my infomants, Miss Amala Chakravarti, and Mrs. Vimala Mohan, who both patiently sacrificed a good deal of valuable time in submitting to my questioning. Miss Chakravarti was my informant for an earlier version of this paper, which dealt with Hindi relative clauses in general; and Mrs. Mohan was the primary informant for the material involving constituent movement. Finally, I thank my friends both inside and outside the department for their interest and kindness (and frequently, sympathy), which have given me the necessary impetus to work.

In transcription of the Hindi sentences I have used capital letters to represent retroflex consonants, double vowels to stand for long vowels, an h following a consonant to represent aspiration, sh to stand for श, ai for ऐ, and au for औ. When quoting other authors, I have simply adopted their transcription.

[2]As generics sentences of this form are acceptable. But generics are not anaphoric.

[3]HB = Hindi Base in Verma's notation.

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# APPENDIX

(1) -ne verbs

Main--subj.
Rel.--subj.

1. vəh ləRka mera choTa bhaii hai jo mere pas rəhta hai.

   'that' 'boy' 'my' 'little' 'brother' 'is' 'who' 'near me' 'lives'

*2. vəh ləRka mera choTa bhaii hai mere pas jo rəhta hai.

*3. mera choTa bhaii vəh ləRka hai jo mere pas rəhta hai.

*4. mera choTa bhaii vəh ləRka hai mere pas jo rəhta hai.

5. jo ləRka mere pas rəhta hai vəh mera choTa bhaii hai.

*6. jo ləRka mere pas rəhta hai mera choTa bhaii vəh hai.

7. mere pas jo ləRka rəhta hai vəh mera choTa bhaii hai.

*8. mere pas jo ləRka rəhta hai mera choTa bhaii vəh hai.

'The boy who is living with me is my little brother.'

First reaction was that (1) was acceptable; (5) and (7) better. Then decided that (1), (5), and (7) were equally good.

(2) -ne verbs

Main--subj.
Rel.--PPO

1. yəh kal shant nəhĩĩ hai jismẽ həm rəhte haĩ.

   'this' 'age' 'peaceful' 'not' 'is' 'which' 'in' 'we' 'live'

2. yəh kal shant nəhĩĩ hai həm jismẽ rəhte haĩ.

3. shant yəh kal nəhĩĩ hai jismẽ həm rəhte haĩ.

4. shant yəh kal nəhĩĩ hai həm jismẽ rəhte haĩ.

5. jis kal mẽ həm rəhte haĩ yəh shant nəhĩĩ hai.

6. jis kal mẽ həm rəhte haĩ shant yəh nəhĩĩ hai.

7. həm jis kal mẽ rəhte haĩ yəh shant nəhĩĩ hai.

8. həm jis kal mẽ rəhte haĩ shant yəh nəhĩĩ hai.

'This age in which we live is not peaceful.'

Mrs. Mohan wrote these sentences to express the thought:

a. jis səməy mẽ həm rəhte haĩ vəh shanti ka nəhĩĩ hai.

b. jis kal mẽ həm rəhte haĩ vəh shanti puurN nəhĩĩ hai.

c. yəh kal jismẽ həm rəhte haĩ shanti puurN nəhĩĩ hai.

d. yəh kal shanti puurN nəhĩĩ hai jismẽ həm rəhte haĩ.

(3) -ne verbs

Main--Subj.
Rel.--Poss.

1. vəh ləRka klas mẽ nəhĩĩ gəya jiskii yəh kitab hai.

'that' 'boy' 'class' 'in' 'not' 'went' 'whose' 'this' 'book' 'is'

*2. vəh ləRka klas mẽ nəhĩĩ gəya yəh jiskii kitab hai.

3. (same as (1))

4. (same as (2))

5. jis ləRke kii yəh kitab hai vəh klas mẽ nəhĩĩ gəya.

6. (same as (5))

7. yəh jis ləRke kii kitab hai vəh klas mẽ nəhĩĩ gəya.

8. (same as (7))

'The boy {whose this book is / who owns this book} didn't go to class.'

(4) -ne verbs

Main--PPO
Rel.--subj.

1. pəkshii us peR pər baiTha tha jo nədii ke kinare pər tha.

   'bird' 'that' 'tree' 'on' 'was sitting' 'which' 'river's' 'bank' 'on' 'was'

*2. pəkshii us peR pər baiTha tha nədii ke kinare pər jo tha.

3. us peR pər pəkshii baiTha tha jo nədii ke kinare pər tha.

*4. us peR pər pəkshii baiTha tha nədii ke kinare pər jo tha.

5. jo peR nədii ke kinare pər tha pəkshii us pər baiTha tha.

6. jo peR nədii ke kinare pər tha us pər pəkshii baiTha tha.

7. nədii ke kinare pər jo peR tha pəkshii us pər baiTha tha.

8. nədii ke kinare pər jo peR tha us pər pəkshii baiTha tha.

'The bird was sitting on the tree which was on the river bank.'

Mrs. Mohan's sentences:

a. jo peR nədii ke kinare pər tha us pər ciRiya baiThii thii.

b. ciRiya us peR pər baiThii thii jo nədii ke kinare pər tha.

(5a) -ne verbs

Main--PPO
Rel.--PPO

1. gay səRək pər cəlii ja rəhii thii jis pər log baiThe hue the.

   'cow' 'street' 'on' 'was going' 'which' 'on' 'people' 'were sitting'

2. gay səRək pər cəlii ja rəhii thii log jis pər baiThe hue the.

3. səRək pər gay cəlii ja rəhii thii jis pər log baiThe hue the.

*4. səRək pər gay cəlii ja rəhii thii log jis pər baiThe hue the.

5. jis səRek pər log baiThe hue the gay us pər cəlii ja rəhii thii.

6. jis səRək pər log baiThe hue the us pər gəy cəlii ja rəhii thii.

7. log jis səRək pər baiThe hue the gəy us pər cəlii ja rəhii thii.

8. log jis səRək pər baiThe hue the us pər gəy cəlii ja rəhii thii.

'The cow was walking on the street on which the people were sitting.'

Sentence (6) is better than (5)· (7) and (8) are acceptable.

Mrs. Mohan first interpreted the rel. clause as modifying gəy 'cow,' then wrote these sentences:

a. gəy səRək pər ghuum rəhii thii jis pər log baiThe hue the.

b. jis səRək pər log baiThe hue the us pər gəy ghuum rəhii thii.

(5b) -ne verbs

Main--PPO
Rel.--PPO

1. pichle sal us məkan mẽ shyam rəhta tha, jismẽ ajkəl ram rəhta hai.

   'last' 'year' 'that' 'house' 'in' 'Shyam' 'used to live' 'which' 'in' 'nowadays' 'Ram' 'lives'

2. pichle sal us məkan mẽ shyam rəhta tha ajkəl jismẽ ram rəhta hai.

3. us məkan mẽ shyam pichle sal rəhta tha jismẽ ram ajkəl rəhta hai.

4. us məkan mẽ shyam pichle sal rəhta tha ajkəl ram jismẽ rəhta hai.

5. jis məkan mẽ ajkəl ram rəhta hai pichle sal usmẽ shyam rəhta tha.

6. jis məkan mẽ ajkəl ram rəhta hai usmẽ pichle sal shyam rəhta tha.

7. ram ajkəl jis məkan mẽ rəhta hai shyam pichle sal usmẽ rəhta tha.

8. ram ajkəl jis məkan mẽ rəhta hai usmẽ shyam pichle sal rəhta tha.

'Last year Shyam used to live in the house in which Ram lives nowadays.'

Mrs. Mohan's sentences:

a. jis ghər mẽ shyam pichle sal rəhta tha {ajkəl usmẽ / usmẽ ajkəl} ram rəhta hai.

b. ajkəl jis ghər mẽ ram rəhta hai {pichle sal usmẽ / usmẽ pichle sal} shyam rəhta tha.

(6) -ne verbs

Main--PPO
Rel.--Poss.

1. kəl maĩ us ləRke ke sath həvaii əDDe gəya jiska bhaii a rəha tha.

'yesterday' 'I' 'that' 'boy' 'with' 'airport' 'went' 'whose' 'brother' 'was coming.'

2. (same as (1))

3. us ləRke ke sath maĩ kəl həvaii əDDe gəya jiska bhaii a rəha tha.

4. (same as (3))

5. jis ləRke ka bhaii a rəha tha kəl maĩ uske səth həvaii əDDe gəya.

6. jis ləRke ka bhaii a rəha tha uske sath {maĩ kəl / kəl maĩ} həvaii əDDe gəya.

7. (same as (5))

8. (same as (6))
(sentence (5) is better than (6)).
'Yesterday I went to the airport with the boy whose brother was coming.'

Mrs. Mohan's sentences:

a. kəl maĩ us ləRke ke sath həvaii əDDe gəii jiska bhaii a rəha tha.
(cf. (1))

b. jis ləRke ka bhaii a rəha tha kəl maĩ uske səth həvaii əDDe gəii.
(cf. (5))

(7) -ne verbs

Main--poss.
Rel.--subj.

1. us kisan ka paisa gayəb ho gəya jo shəhər mẽ baukhla gəya.

'that' 'peasant's' 'money' 'disappeared' 'who' 'city' 'in' 'became confused'

*2. us kisan ka paisa gayəb ho gəya shəhər mẽ jo baukhla gəya.

3. (same as (1))

4. (same as (2))

5. jo kisan shəhər mẽ baukhla gəya uska paisa gayəb ho gəya.

6. (same as (5))

7. shəhər mẽ jo kisan baukhla gəya uska paisa gayəb ho gəya.

8. (same as (7))

'The money of the peasant who became confused in the city disappeared.'

Mrs. Mohan's sentence:

us kisan ka paisa gayəb ho gəya jo shəhər mẽ akər baukhla gəya.

Note that (5) is acceptable, but it emphasizes peasant, not money.

(8) -ne verbs

Main--Poss
Rel.--PPO

1. us məkan kii bəttiyã jəgməga rəhii thĩĩ jismẽ ram rəhta hai.

'that' 'house's' 'lights' 'were glittering' 'which' 'in' 'Ram' 'lives.'

2. us məkan kii bəttiyã jəgməga rəhii thĩĩ ram jismẽ rəhta hai.

3. (same as (1))

4. (same as (2))

5. jis məkan mẽ ram rəhta hai uskii bəttiyã jəgməga rəhii thĩĩ.

6. (same as (5))

7. ram jis məkan mẽ rəhta hai uskii bəttiyã jəgməga rəhii thĩĩ.

8. (same as (7))

'The lights of the house in which Ram lives were glittering.'

(1) is better than (2); (2) and (5) are acceptable; and (7) is acceptable and chosen first.

(9) -ne verbs

Main--poss.
Rel.--poss. (Q/generic (sort of 'whoever')

1. kya yəh kələm bhii uskii hai jiskii yəh kitab hai?

   'Q' 'this' 'pen' 'also' 'his' 'is' 'whose' 'this' 'book' 'is'

*2. kya yəh kələm bhii uskii hai yəh kitab jiskii hai?

*3. kya uskii yəh kələm bhii hai jiskii yəh kitab hai?

4. kya uskii yəh kələm bhii hai yəh kitab jiskii hai?

5. jiskii yəh kitab hai kya yəh kələm bhii uskii hai?

6. jiskii yəh kitab hai kya uskii yəh kələm bhii hai?

7. yəh kitab jiskii hai kya yəh kələm bhii uskii hai?

8. yəh kitab jiskii hai kya uskii yəh kələm bhii hai?

'Does this pen also belong to whoever owns this book?'

(1) is the best and in (4) jis refers to kələm. (?)

(10)

Main--subj., +ne
Rel.--subj., -ne

1. us məriiz ne dəva pii jo rəvivər se əspətal mẽ tha.

   'that' 'patient' 'medicine' 'drank' 'who' 'Sunday' 'since' 'hospital' 'in' 'was'

*2. us məriiz ne dəva pii rəvivər se əspətal mẽ jo tha.

3. (same as (1))

4. (same as (2))

5. jo məriiz rəvivər se əspətal mẽ tha usne dəva pii.

6. (same as (5))

7. rəvivər se əspətal mẽ jo məriiz tha usne dəva pii.

8. (same as (7))

'The patient who had been in the hospital since Sunday drank the medicine.'

Mrs. Mohan's sentences:

a. məriiz ne, jo itvar se əspətal mẽ tha, dəva pii.

b. məriiz ne dəva pii jo itvar se əspətal mẽ tha.

Time adverb must precede place adverb.

(11)

Main--subj., +ne
Rel.--PPO, -ne

1. us admii ne əpnii pətnii ke liye ek saRii xəriidii jiske sath ram bazar gəya.

   'that' 'man' 'his own' 'wife' 'for' 'one' 'sari' 'bought' 'whom' 'with' 'Ram' 'bazaar' 'went'

2. us admii ne əpnii pətnii ke liye ek saRii xəriidii ram jiske sath bazar gəya.

3. (same as (1))

4. (same as (2))

5. jis admii ke sath ram bazar gəya usne əpnii pətnii ke liye ek saRii xəriidii.

6. (same as (5))

7. ram jis admii ke sath bazar gəya usne əpnii pətnii ke liye ek saRii xəriidii.

8. (same as (7))

'The man with whom Ram went to the bazaar bought a sari for his wife.

(1) and (2) are acceptable, but (5) and (7) are more clear.

(12)

Main--subj., +ne
Rel.--poss., -ne

1. dhobii ko us duukandar ne galii dii jiskii beTii merii səhelii hai.

   'washerman' 'to' 'that' 'merchant' 'insult' 'gave' 'whose' 'daughter' 'my' 'friend' 'is'

2. dhobii ko us duukandar ne galii dii merii səhelii jiskii beTii hai.

3. us duukandar ne dhobii ko galii dii jiskii beTii merii səhelii hai.

4. us duukandar ne dhobii ko galii dii merii səhelii jiskii beTii hai.

5. jis duukandar kii beTii merii səhelii hai dhobii ko usne galii dii.

6. jis duukandar kii beTii merii səhelii hai usne dhobii ko galii dii.

7. merii səhelii jis duukandar kii beTii hai dhobii ko usne galii dii.

8. merii səhelii jis duukandar kii beTii hai usne dhobii ko galii dii.

'The merchant whose daughter is my friend insulted the dhobi.'

(2), (4), (7), and (8) are acceptable.

(14)

Main--DO, +ne
Rel.--PPO, -ne

1. həmne vəh kursii dekhii jis pər vashingTən baiThe the.

   'we' 'that' 'chair' 'saw' 'which' 'on' 'Washington' 'had sat'

2. həmne vəh kursii dekhii vashingTən jis pər baiThe the.

3. vəh kursii həmne dekhii jis pər vashingTən baiThe the.

4. vəh kursii həmne dekhii vashingTən jis pər baiThe the.

5. jis kursii pər vashingTən baiThe the həmne vəh dekhii.

6. jis kursii pər vashingTən baiThe the vəh həmne dekhii.

7. vashingTən jis kursii pər baiThe the həmne vəh dekhii.

8. vashingTən jis kursii pər baiThe the vəh həmne dekhii.

'We saw the chair in which Washington had sat.'

(15)

Main--DO, +ne
Rel.--poss., -ne

1. unhõne us duukandar ko chəla jiska nam singh hai.

   'they' 'that' 'merchant' 'to' 'cheated' 'whose' 'name' 'Singh' 'is'

2. unhõne us duukandar ko chəla singh jiska nam hai.

3. us duukandar ko unhõne chəla jiska nam singh hai.

4. us duukandar ko unhõne chəla singh jiska nam hai.

5. jis duukandar ka nam singh hai unhõne use chəla.

6. jis duukandar ka nam singh hai use unhõne chəla.

7. singh jis duukandar ka nam hai unhõne use chəla.

8. singh jis duukandar ka nam hai use unhõne chəla.

'They cheated the merchant whose name is Singh.'

(1) is the best; (2), (4), (5), (6), (7), and (8) are acceptable; and there is hardly any difference between (4), (5), (6), (7), and (8).

(16)

Main--IO, +ne
Rel.--subj., -ne

1. həmne us ləRke ko yəh bat bətaii jo yəhã khel rəha tha.

   'we' 'that' 'boy' 'to' 'this' 'thing' 'related' 'who' 'here' 'was playing'

2. həmne us ləRke ko yəh bat bətaii yəhã jo khel rəha tha.

3. us ləRke ko həmne yəh bat bətaii jo yəhã khel rəha tha.

4. us ləRke ko həmne yəh bat bətaii yəhã jo khel rəha tha.

5. jo ləRka yəhɑ̃ khel rəha tha həmne use yəh bat bətaii.

6. jo ləRka yəhɑ̃ khel rəha tha use həmne yəh bat bətaii.

7. yəhɑ̃ jo ləRka khel rəha tha həmne use yəh bat bətaii.

8. yəhɑ̃ jo ləRka khel rəha tha use həmne yəh bat bətaii.

'We told the thing to the boy who was playing here.'

(2), (3), (4), (6), (7), and (8) are acceptable.

(17)

Main--IO, +ne
Rel.--PPO, -ne

1. shikshək ne us chatr ko kagəz diya jisse jəvab aya tha.

   'teacher' 'that' 'pupil' 'to' 'paper' 'gave' 'from whom' 'answer' 'had come'

2. shikshək ne us chatr ko kagəz diya jəvab jisse aya tha.

3. us chatr ko shikshək ne kagəz diya jisse jəvab aya tha.

4. us chatr ko shikshək ne kagəz diya jəvab jisse aya tha.

5. jis chatr ka jəvab aya tha shikshək ne use kagəz diya.

6. jis chatr ka jəvab aya tha use shikshək ne kagəz diya.

7. jəvab jis chatr se aya tha shikshək ne use kagəz diya.

8. jəvab jis chatr se aya tha use shikshək ne kagəz diya.

'The teacher gave the paper to the pupil from whom the answer had come.'

(1) and (2) are not very good sentences; in (5) and (6) the change is from se to ka.

Mrs. Mohan's sentence:

a. shikshək ne us chatr ko kagəz diya jiska jəvab aya tha.

Mrs. Kachru's sentence:

b. shikshək ne us chatr ko kagəz diya jisse use jəvab mila tha.

On seeing Mrs. Kachru's sentence, Mrs. Mohan wrote the following:

c. shikshək ne us vidyarthii ko kagəz diya jisse use jəvab{a cuka tha. / mila tha.}

(18)

Main--IO, +ne
Rel.--poss., -ne

1. usne us ləRkii ko uphar diya jiske marks səbse əcche the.

'he' 'that' 'girl' 'to' 'prize' 'gave' 'whose' 'marks' 'all' 'from' 'good' 'were'

2. usne us ləRkii ko uphar diya səbse əcche jiske marks the.

3. us ləRkii ko usne uphar diya jiske marks səbse əcche the.

4. us ləRkii ko usne uphar diya səbse əcche jiske marks the.

5. jis ləRkii ke marks səbse əcche the usne use uphar diya.

6. jis ləRkii ke marks səbse əcche the use usne uphar diya.

*7. səbse əcche jis ləRkii ke marks the usne use uphar diya.

*8. səbse əcche jis ləRkii ke marks the use usne uphar diya.

'He gave the prize to the girl whose grades were the best.'

(3) and (5) have the clearest references; (5) is ambiguous; (7) and (8) are acceptable to Mrs. Kachru, but the focus has changed.

(19)

Main--PPO, +ne
Rel.--subj., -ne

1. həmne us ghəTna ke bare mẽ batciit kii jo kəl yəhã huii thii.

'we' 'that' 'incident' 'about' 'conversation' 'did' 'which' 'yesterday' 'here' 'happened'

2. həmne us ghəTna ke bare mẽ batciit kii kəl yəhã jo huii thii.

3. us ghəTna ke bare mẽ həmne batciit kii jo kəl yəhã huii thii.

4. us ghəTna ke bare mẽ həmne batciit kii kəl yəhã jo huii thii.

5. jo ghəTna kəl yəhã huii thii uske bare mẽ həmne batciit kii.

6. jo ghəTna kəl yəhã huii thii həmne uske bare mẽ batciit kii.

7. kəl yəhã jo ghəTna huii thii uske bare mẽ həmne batciit kii.

8. kəl yəhã jo ghəTna huii thii həmne uske bare mẽ batciit kii.

'We talked about the incident which occurred here yesterday.

(20)

Main--PPO, +ne
Rel.--poss., -ne

1a. maĩ ne us kisan ke bare mẽ suna jisse paisa curaya gəya tha.

'I' 'that' 'peasant' 'about' 'heard' 'from whom' 'money' 'was stolen'

1b. maĩ ne us kisan ke bare mẽ suna jiska paisa curaya gəya tha.

'I' 'that' 'peasant' 'about' 'heard' 'whose' 'money' 'was stolen'

2. (same as (1b))

3. us kisan ke bare mẽ maĩ ne suna jiska paisa curaya gəya tha.

4. (same as (3))

5. jis kisan ka paisa curaya gəya tha maĩ ne uske bare mẽ suna.

6. jis kisan ka paisa curaya gəya tha uske bare mẽ maĩ ne suna.

7. (same as (5))

8. (same as (6))

'I heard about the peasant from whom the money was stolen.'

intended meaning (as in (1a)) but change in postposition makes it

'I heard about the peasant whose money was stolen.' (as in (1b))

(6) is ambiguous referring to <u>incident</u> or <u>peasant</u>.

(21)

Main--PPO, +ne
Rel.--poss., -ne

1. kya apne us admii se batciit kii jiskii kar kəl nəhĩĩ cəlii?

   'Q' 'you' 'that' 'man' 'with' 'conversation' 'did' 'whose' 'car' 'yesterday' 'not' 'moved'

2. kya apne us admii se batciit kii kəl jiskii kar nəhĩĩ cəlii?

3. kya us admii se apne batciit kii jiskii kar kəl nəhĩĩ cəlii?

4. kya us admii se apne batciit kii kəl jiskii kar nəhĩĩ cəlii?

5. jis admii kii kar kəl nəhĩĩ cəlii kya apne usse batciit kii?

6. jis admii kii kar kəl nəhĩĩ cəlii kya usse apne batciit kii?

7. kəl jis admii kii kar nəhĩĩ cəlii kya apne usse batciit kii?

8. kəl jis admii kii kar nəhĩĩ cəlii kya usse apne batciit kii?

'Did you converse with the man whose car did not start yesterday?'

(1) is the clearest; (6) is better than (5); and (2), (3), (4), (7), and (8) are acceptable.

(22)

Main--poss., +ne
Rel.--subj., -ne

1. us ləRkii kii bəhən am kha rəhii hai jo kəl yəhã̃ aii.

   'that' 'girl's' 'sister' 'mango' 'is eating' 'who' 'yesterday' 'here' 'came'

2. us ləRkii kii bəhən am kha rəhii hai kəl yəhã̃ jo aii.

3. am us ləRkii kii bəhən kha rəhii hai jo kəl yəhã̃ aii.

4. am us ləRkii kii bəhən kha rəhii hai kəl yəhã̃ jo aii.

*5. jo ləRkii kəl yəhã̃ aii am uskii bəhən kha rəhii hai.

6. jo ləRkii kəl yəhã̃ aii uskii bəhən am kha rəhii hai.

*7. kəl yəhɛ̃ jo ləRkii aii am uskii bəhən kha rəhii hai.

8. kəl yəhɛ̃ jo ləRkii aii uskii bəhən am kha rəhii hai.

'The sister of the girl who arrived here yesterday is eating the mango.'

(23)

Main--poss., +ne
Rel.--PPO, -ne

1. us ləRkii ke dhobii ne (pərishrəm se) mehnət kii jis pər tel gira tha.

'that' 'girl's' 'dhobi' 'hard work' 'did' 'whom' 'on' 'oil' 'had spilled'

2. us ləRkii ke dhobii ne mehnət kii tel jis pər gira tha.

3. (same as (1))

4. (same as (2))

5. jis ləRkii pər tel gira tha uske dhobii ne mehnət kii.

6. jis ləRkii kii saRii pər tel gira tha uske dhobii ne mehnət kii.

7. tel jis ləRkii pər gira tha uske dhobii ne mehnət kii.

8. (same as (7))

'The dhobi of the girl on whom the oil had spilled worked hard.'

Because she said the sentence sounded to her as though the dhobi were washing the girl, Mrs. Mohan added the sari reference in pattern (6). Because of redundancy the pərishrəm se was deleted, and then there was nothing to prepose in patterns (5) - (8). Therefore, Mrs. Kachru gave me the following sentence with a PPhrase and a poss.:

a. us ləRkii ke DakTər ne savdhanii se ilaj kiya jis pər diivar girii thii.

'that' 'girl's' 'doctor' 'carefully' 'cure' 'did' 'whom' 'on' 'wall' 'had fallen'

'The doctor of the girl on whom the wall had fallen carefully performed the cure.'

Mrs. Mohan revised this to read as (b); and then on being told the sentence I was searching for, composed (c) and (d):

b. us ləRkii ka DakTər ne savdhanii se ilaj kiya jis pər diivar girii thii.

'The doctor easily performed the cure of the girl on whom the wall had fallen.'

c. us ləRke ke pita ne əspətal bənane ke liye paisa diya jo vəhɛ̃ khəRa tha.

'that' 'boy's' 'father' 'hospital' 'to build' 'for' 'money' 'gave' 'who' 'there' 'was standing'

'The father of the boy who was standing there gave money to build the hospital.'

d. us ləRkii ke pita ne əspətal bənane ke liye paisa diya jisne niili saRii pəhnii hai.

'that' 'girl's' 'father' 'hospital' 'to build' 'for' 'money' 'gave' 'who' 'blue' 'sari' 'wore'

'The father of the girl who wore the blue sari gave money to build the hospital.'

(24)

Main--poss., +ne
Rel.--poss., -ne

1. is duukan se us ləRkii ke pita ne phuul xəriide jiskii shadii pichle həfte huii.

'this' 'shop' 'from' 'that' 'girl's' 'father' 'flowers' 'bought' 'whose' 'wedding' 'last' 'week' 'occurred'

2. is duukan se us ləRkii ke pita ne phuul xəriide pichle həfte jiskii shadii huii.

3. us ləRkii ke pita ne is duukan se phuul xəriide jiskii shadii pichle həfte huii.

4. us ləRkii ke pita ne is duukan se phuul xəriide pichle həfte jiskii

shadii huii.

5. jis ləRkii kii shadii pichle həfte huii is duukan se uske pita ne phuul xəriide.

6. jis ləRkii kii shadii pichle həfte huii uske pita ne is duukan se phuul xəriide.

7. pichle həfte jis ləRkii kii shadii huii is duukan se uske pita ne phuul xəriide.

8. pichle həfte jis ləRkii kii shadii huii uske pita ne is duukan se phuul xəriide.

'The father of the girl whose wedding occurred last week bought the flowers at this shop.'

Mrs. Mohan's sentences:

a. jis ləRkii kii shadii pichle həfte huii thii pita ne uske liye is duukan se phuul xəriide the.

b. pita ne us ləRkii ke liye is duukan se phuul xəriide the jiskii shadii pichle həfte huii thii.

(25)

Main--subj., -ne
Rel.--subj., +ne

1. rəvivar se əspətal mẽ məriiz tha jisne dəva pii.

'Sunday' 'since' 'hospital' 'in' 'patient' 'was' 'who' 'medicine' 'dran

2. rəvivar se əspətal mẽ məriiz tha dəva jisne pii.

3. məriiz rəvivar se əspətal mẽ tha jisne dəva pii.

4. məriiz rəvivar se əspətal mẽ tha dəva jisne pii.

5. jis məriiz ne dəva pii rəvivar se əspətal mẽ vəh tha.

6. jis məriiz ne dəva pii vəh rəvivar se əspətal mẽ tha.

7. dəva jis məriiz ne pii rəvivar se əspətal mẽ vəh tha.

8. dəva jis məriiz ne pii vəh rəvivar se əspətal mẽ tha.

'The patient who drank the medicine had been in the hospital since Sunday.'

(26)

Main--PPO, -ne
Rel.--subj., +ne

1. ram us admii ke sath bazar gəya jisne əpnii pətnii ke liye ek saRii xəriidii.

   'Ram' 'that' 'man' 'with' 'bazaar' 'went' 'who' 'his own' 'wife' 'for' 'a' 'sari' 'bought'

2. ram us admii ke sath bazar gəya əpnii pətnii ke liye jisne ek saRii xəriidii.

3. us admii ke sath ram bazar gəya jisne əpnii pətnii ke liye ek saRii xəriidii.

*4. us admii ke sath ram bazar gəya əpnii pətnii ke liye ek saRii xəriidii.

5. jis admii ne əpnii pətnii ke liye ek saRii xəriidii ram uske sath bazar gəya.

6. jis admii ne əpnii pətnii ke liye ek saRii xəriidii uske sath ram bazar gəya.

7. əpnii pətnii ke liye jis admii ne ek saRii xəriidii ram uske sath bazar gəya.

8. əpnii pətnii ke liye jis admii ne ek saRii xəriidii uske sath ram bazar gəya.

'Ram went to the bazaar with the man who bought a sari for his wife.'

In (1) jis always refers to admii, and the ungrammaticality of (4) is probably due to the inadvertent omission of jisne. The sentence should read ... jisne ek saRii xəriidii.

(27)

Main--poss., -ne
Rel.--subj., +ne

1. merii səhelii us duukandar kii beTii hai jisne dhobii ko galii dii.

   'my' 'friend' 'that' 'merchant's' 'daughter' 'is' 'who' 'dhobi' 'to' 'insult' 'gave'

2. merii səhelii us duukandar kii beTii hai dhobii ko jisne galii dii.

3. us duukandar kii beTii merii səhelii hai jisne dhobii ko galii dii.

4. us duukandar kii beTii merii səhelii hai dhobii ko jisne galii dii.

5. jis duukandar ne dhobii ko galii dii merii səhelii uskii beTii hai.

6. jis duukandar ne dhobii ko galii dii uskii beTii merii səhelii hai.

7. dhobii ko jis duukandar ne galii dii merii səhelii uskii beTii hai.

8. dhobii ko jis duukandar ne galii dii uskii beTii merii səhelii hai.

'My friend is the daughter of the merchant who berated/insulted the dhobi.'

Because the verb is copular, there is a change in predication when constituent order is reversed:

'The daughter of the merchant who berated/insulted the dhobi is my friend.'

(28)

Main--subj., -ne
Rel.--DO, +ne

1. vəh khilauna bəcce ke hath mẽ hai jo uskii nanii ne use diya.

   'that' 'toy' 'child's' 'hand' 'in' 'is' 'which' 'his' 'grandmother' 'him' 'gave'

*2. vəh khilaunə bəcce ke hath mẽ hai uskii nanii ne use jo diya.

3. bəcce ke hath mẽ vəh khilaunə hai jo uskii nanii ne use diya.

*4. bəcce ke hath mẽ vəh khilaunə hai uskii nanii ne use jo diya.

5. jo khilaunə bəcce kii nanii ne use diya vəh uske hath mẽ hai.

6. jo khilaunə bəcce kii nanii ne use diya uske hath mẽ vəh hai.

*7. bəcce kii nanii ne use jo khilaunə diya vəh uske hath mẽ hai.

*8. bəcce kii nanii ne use jo khilaunə diya uske hath mẽ vəh hai.

'The toy which his grandmother gave him is in the child's hand.'

(29) +ne verbs

Main--subj.
Rel.--poss.

1. bhaĩs ko us ləRkii ne thəpthəpaya jiskə səb janvərõ ne vishvas kiya.

'buffalo' 'that' 'girl' 'patted' 'whose' 'all' 'animals' 'trust' 'did'

*2. bhaĩs ko us ləRkii ne thəpthəpaya səb janvərõ ne jiskə vishvas kiya.

3. us ləRkii ne bhaĩs ko thəpthəpaya jiskə səb janvərõ ne vishvas kiya.

4. us ləRkii ne bhaĩs ko thəpthəpaya səb janvərõ ne jiskə vishvas kiya.

5. jis ləRkii ka səb janvərõ ne vishvas kiya bhaĩs ko usne thəpthəpaya.

6. jis ləRkii ka səb janvərõ ne vishvas kiya usne bhaĩs ko thəpthəpaya.

7. səb janvərõ ne jis ləRkii ka vishvas kiya bhaĩs ko usne thəpthəpaya.

8. səb janvərõ ne jis ləRkii ka vishvas kiya usne bhaĩs ko thəpthəpaya.

'The girl whom all the animals trusted patted the buffalo.'

Mrs. Mohan's sentence:

us ləRkii ne bhaĩs ko thəpthəpaya jiskə səb janvərõ ne vishvas kiya.

(cf. (3)).

(30) +ne verbs

Main--DO
Rel.--subj.

1. pulis ne us admii ko girəftar kiya jisne baink se paisa curaya tha.

   'police' 'that' 'man' 'arrest' 'did' 'who' 'bank' 'from' 'money' 'had stolen'

2. pulis ne us admii ko girəftar kiya baink se jisne paisa curaya tha.

3. us admii ko pulis ne girəftar kiya jisne baink se paisa curaya tha.

4. us admii ko pulis ne girəftar kiya baink se jisne paisa curaya tha.

5. iis admii ne baink se paisa curaya tha pulis ne use girəftar kiya.

6. jis admii ne baink se paisa curaya tha use pulis ne girəftar kiya.

7. baink se jis admii ne paisa curaya tha pulis ne use girəftar kiya.

8. baink se jis admii ne paisa curaya tha use pulis ne girəftar kiya.

'The police arrested the man who had stolen the money from the bank.'

(31) +ne verbs

Main--DO
Rel.--DO

1. maĩ ne vəh kitab nəhĩĩ xəriidii jo kəl apne bətaii.

   'I' 'that' 'book' 'not' 'bought' 'which' 'yesterday' 'you' 'related'

2. maĩ ne vəh kitab nəhĩĩ xəriidii kəl apne jo bətaii.

3. vəh kitab maĩ ne nəhĩĩ xəriidii jo kəl apne bətaii.

4. vəh kitab maĩ ne nəhĩĩ xəriidii kəl apne jo bətaii.

5. jo kitab apne kəl bətaii maĩ ne vəh nəhĩĩ xəriidii.

6. jo kitab apne kəl bətaii vəh maĩ ne nəhĩĩ xəriidii.

7. apne jo kitab kəl bətaii maĩ ne vəh nəhĩĩ xəriidii.

8. apne jo kitab kəl bətaii vəh maĩ ne nəhĩĩ xəriidii.

'I didn't buy the book which you told about yesterday.'

Mrs. Mohan's sentence:

maĩ ne vəh kitab nəhĩĩ xəriidii hai jiske bare mẽ apne kəl bətaya tha.

(32) milna

Main--DO
Rel.--DO

1. shyam ko vəh chatrvritti nəhĩĩ milii jo ram ko milii.

   'Shyam' 'to' 'that' 'scholarship' 'not' 'met' 'which' 'Ram' 'to' 'met'

2. shyam ko vəh chatrvritti nəhĩĩ milii ram ko jo milii.

3. vəh chatrvritti shyam ko nəhĩĩ milii jo ram ko milii.

4. vəh chatrvritti shyam ko nəhĩĩ milii ram ko jo milii.

5. jo chatrvritti ram ko milii vəh shyam ko nəhĩĩ milii.

6. jo chatrvritti ram ko milii vəh shyam ko nəhĩĩ milii.

7. ram ko jo chatrvritti milii shyam ko vəh nəhĩĩ milii.

8. ram ko jo chatrvritti milii vəh shyam ko nəhĩĩ milii.

'Shyam didn't get the scholarship which Ram got.'

# CAUSATIVE SENTENCES IN HINDI REVISITED

by

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1.0 The causative sentences in Hindi have been discussed in a number of recent linguistic works and some very interesting facts have come to light as a result of these.[1] Most descriptions agree that causative sentences involve the process of embedding, but in one of the works, it has been claimed that ' ... causative sentences in Hindi do not have embeddings and have the structure of a simplex sentence' (Balachandran op. cit. 64). Since some very powerful arguments have been given to support various claims made in the works mentioned above, it may not be entirely useless to reexamine the whole topic of causative sentences in Hindi and see what could be an explanatory account of the phenomenon so widely discussed. Also, the causative sentences in Hindi are of theoretical interest in so far as they support a particular hypothesis about the nature of lexical insertions in a transformational grammar: they provide evidence for McCawley's claim that ' ... the complex of semantic material which a lexical item corresponds to need not be a constituent which arises through a transformation ... ' (McCawley 1968:72). The causative sentences in Hindi, however, question McCawley's suggestion with regard to ' ... requiring all lexical insertions to take place after the cycle but before the postcyclic rules' as a 'way of constraining lexical insertions so that their ordering would not be a way in which languages could differ'. (McCawley 1968:78). In this respect, it is interesting to compare the properties of the causative sentences with those of the ko-sentences in Hindi.[2] By ko-sentences, I mean sentences such as the following:

1. ram ko bhūkh lagī
   'Ram' 'to' 'hunger' 'felt'
   Ram felt hungry.
2. mujhko lagta hɛ ki bariš hogī
   'me' 'to' 'feels' 'that' 'rain' 'will happen'
   'It seems to me that it will rain.

Notice that in these sentences, the logical subjects ('Ram' and 'I' respectively) appear with a dative postposition (ko), and the complements ('hunger' and 'that S' respectively) function as grammatical subjects. I shall discuss the nature of ko-sentences as it relates to the hypothesis of lexical insertion towards the end of this paper.

1.1 Three of the works mentioned above list verbal subclasses relevant to a discussion of causativization in Hindi (Bahl 1967, Kachru 1966, Balchandran 1970). I shall not summarize their findings here. The questions which are most interesting to review are the following: (i) do the causative sentences involve embeddings, and if so, is the causative rule a postlexical transformational rule?[3] (ii) which grammaticosemantic features of verbs are relevent for causativization and for case assignment to the various Noun Phrases that occur in a causative sentence? These will be taken up in the following discussion.

2.0 The main arguments that Balchandran presents in support of her claim that causative sentences do not have embeddings are the following: first, the noncausal verb can occur with a number of manner adverbials, but when embedded under a causative node, the noncausative or innermost verb can not be modified by such

adverbials, e.g., munna rote - rote so gəya 'The child fell asleep crying' is a good sentence of Hindi, but in jĩjĩ ne munne ko rote - rote sulaya 'The elder sister put the child to sleep crying' the adverbial rote - rote refers back to jĩjĩ and not to munna. There is no natural way the grammar could impose a restriction that embedded verbs under causative could not be modified by manner adverbials. Second, some restrictions have to be specified with regard to the occurrence of reflexive pronouns in causative sentences, e.g., in ram ne əpne kəpṛe pəhne 'Ram wore his clothes' the reflexive pronoun əpna refers back to Ram, but in mohən ne ram ko əpne kəpṛe pəhnae 'Mohan caused Ram to wear his clothes', the reflexive pronoun əpna unambiguously refers back to Mohan and not to Ram. Since both reflexive and causative rules are cyclic, it would be impossible to constrain the reflexive rule in a way that would ensure its application only after the causative rule. Third, semantically, it is not true that the causative sentence implies the noncausative sentence, e.g. the following sentence is grammatical mã̃ ne bəcce ko sulaya pər vəh nəhĩ̃ soya 'Mother put the child to sleep but he didn't sleep' although the negative sentence with the noncausal verb denies what the positive sentence with the causal verb asserts. Finally, the deep structure case marking of Agent or Experiencer remains the same in the causative sentences also, so that although mɛ̃ ne lərke ko d·raya 'I made the boy run' is a grammatical causative sentence and lərka in this sentence is superficially marked as object (with the ob-

jective marker ko), the adjectivization rule does not apply to this sentence and yield a phrase *merə d̤ raya hua lə̤rkə 'the boy made to run by me' because lə̤rkə retains its Agent function in the causative sentence, too.

I argue below that the first argument presented by Balchandran is only partially correct, the third is wrong, and there are well-argued answers for the second and the fourth (cf. 3.0 and 2.3 respectively).

2.1 It is not correct that the manner adverbials that occur in the innermost sentences could not occur with the same reference in the complex (causative) sentences. Consider the following sentences:

3. nərs ne rogī ko le̤te - le̤te dəva pila dī̃

'The nurse caused the patient to drink the medicine lying.'

4. mɛ̃ in bədtəmīz lə̤rkõ ko kha̤re - kha̤re nikəlva dūnga

'I shall have these ill-mannered boys thrown out (while (I am / they are) still) standing.'

5. pulis ne garī ko cə̤lte - cə̤lte rukva liya

'The police made the vehicle stop (while) moving.'

6. mɛ̃ ne nɔkər se savdhanī se bistə̤re ləgvae

'Mother made the servant make the beds carefully.'

Notice that sentences 3-6 are ambiguous. The adverbials le̤te - le̤te, kha̤re - kha̤re, cə̤lte - cə̤lte, and savdhanī se do not refer back unambiguously either to nərs, mɛ̃, pulis and mɛ̃ or to rogī, lə̤rke, garī and nɔkər respectively. For at least some speakers of Hindi, an unambiguous reference will be signalled by a change of order in

the surface-structure, e.g.:

7. mã̃ ne lete - lete ram ko kehanī sunaī

'Mother told Ram a story lying.'

8. sikšək ne khəre - khəre šərarətī lərke ko nikəlva diya

'The teacher had the mischievous boy thrown out (while) standing.'

9. pulis ne cəlte - cəlte garī rukva lī

'The police made the vehicle stop (while) leaving.'

The above seems to be true of all manner adverbials derived from intransitive verbs; the only exceptions seem to be verbs of expression such as hõsna, rona, etc. It may be the case that verbs such as hõsna, rona etc. are verbs of volition just as the majority of transitive verbs in Hindi are and therefore there is a 'preference' to interpret adverbials derived from these verbs as referring to that Agent of the sentence who 'controls' the action, event or process rather than the Agent who merely performs the action, or experiences the experience, or is affected by the event.[4] This is not an entirely unmotivated suggestion, but, other considerations point to a more acceptable solution of the problem which is briefly discussed in 3.2.

2.2 Balchandran's argument that sentences such as 10 are well formed is incorrect:

10. *mã̃ ne bəcce ko khilaya, phir bhī usne nəhi khaya

*'The mother made the child eat but he did not eat.'

Notice that the English sentence is ungrammatical as the adversative conjunction conjoining a negation of what is asserted by the first conjunct produces a contradiction. In general, a causative, especially

with a perfective, implies the completion of the action/process/event instigated, hence, all the following sentences are ungrammatical:

11. *mɛ̃ ne pani ubala, par pani nahi ubla
*'I boiled the water, but it didn't boil.'

12. *nɔkar ne bacce ko kapre pahnae, phir bhi usne nahi pahne
*'The servant dressed the child but the child didn't get dressed.'

13. *ram ne mohan se upanyas xaridvaya, par mohan ne nahi xarida
*'Ram made Mohan buy a novel but he didn't buy (it).'

A higher performative verb, however, will result in grammatical sentences:

14. mɛ̃ ne pani ubalne ki koši ki, par pani nahi ubla
'I tried to boil the water but it didn't boil.'

15. ram ne mohan se upanyas xaridvane ka prayatn kiya par mohan ne nahi xarida
'Ram tried to make Mohan buy a novel, but Mohan did not buy it.'

2.3 The implication of the reflexive rule will be discussed after a reply to Balchandran's fourth argument is outlined. It is not correct that *mera d ṛaya hua lərkə is ungrammatical only because of the deep structure case (Agent, in this instance) of lərkə. In the following examples, all noun phrases that contain a past participial modifier modifying an animate noun are ungrammatical:

16. mɛ̃ ne lərke ko pukara

'I called the boy.'

16a. *lərka mera pukara hua hɛ̃

16b. *mera pukara hua lərka

17. mɛ̃ ne kutte ko səhlaya

'I patted the dog.'

17a. *kutta mera səhlaya hua h

17b. *mera səhlaya hua kutta

18. pulis ne cor ko pəkra
'The police arrested the thief.'

18a. *cor pulis ka pəkra hua h

18b. *pulis ka pəkra hua cor

Notice that all the verbs above, i.e., pukarna, səhlana, pəkərna are inherently transitive, hence, the deep structure case of the nouns lərka, kutta and cor are not responsible for the ungrammaticality of 16-18.[7] The adjectivization rule of Hindi is constrained in such a way that transitive verbs with animate objects do not yield past participial modifiers that modify the animate object.[8]

2.4 It is clear from the foregoing discussion that the arguments presented to support the claim that causative sentences do not involve embedding are not overwhelmingly convincing. Even Balchandran notices the regularity with which the 'Non-Causative, Direct Causative and Indirect Causative stems of the verbs are related' to each other (Balchandran op. cit. 90). She also argues against listing the three stems of a verb separately in the lexicon and proposes 'we can enter for each verb an underlying stem from which

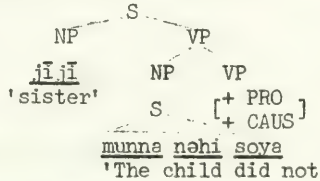
the variant stems can be derived by some general morphophonemic rules ... For each verb we can specify the Basic Case Frame in the lexicon. The Basic Case Frame is the array of cases in which the verb in question appears when it is Non-Causative ... The case-frame that is required for a verb when it gets marked for Causative features can be derived from the basic case frame by way of some general Redundancy Rules (Balchandran op. cit. 93).

3.0 A grammatical description of the process of causativization in Hindi has to account for the following facts. The noncausative and causative sentences are related, both syntactically and semantically, in regular ways. The most satisfactory account of this regularity is achieved if we propose that the causative rule is a recursive rule and that causative sentences involve embedding. The fact that the causative rule does not interact with rules such as reflexivization and adverbialization suggests that causative rule is not a post-lexical transformational rule. If it were a postlexical transformational rule which was cyclic, it would have to interact with reflexivization and adverbialization rules, but such interaction produces ungrammatical sentences in Hindi. The only reasonable explanation, then, is that the causativization rule is a prelexical transformational rule, as Kleiman has suggested.[9] If we accept her suggestion, all the above and some additional facts get a natural explanation. The fact that in ram ne mohən ko əpne kəpre pəhnae, the reflexive əpna does not refer to mohən is explained in the following way. The underlying representation of the sentence,

roughly, is: [X[Y WEAR[Z's clothes]]CAUSE]. The semantic material (X(Y WEAR)CAUSE) is incorporated by a causativization rule and thus, the agent of (WEAR(CAUSE)) now is X. In case X and Z are identical, reflexivization takes place, otherwise it is blocked. The additional facts that get an explanation are as follows:

3.1 Notice that the innermost sentence of a causative sentence in Hindi can not be negative. That is, the following underlying structure does not result in a grammatical causative sentence in Hindi.[10]

A




If it is accepted that the causative rule is a prelexical rule and that the lexical verb sulana substitutes the underlying semantic material (X(Y(SLEEP)CAUSE), it is obvious why A does not yield a grammatical sentence; there is no lexical verb in Hindi to replace (X(Y NOT SLEEP) CAUSE).

3.2 Consider the following sentences:

19. bəcca khana kha kər soya.

'Having eaten, the child went to sleep.'

20. mɛ̃ ne bəcce ko khana kha kər sulaya.

a. 'Having eaten, the mother put the child to sleep.'

b. *'The child having eaten, the mother put him to sleep.'

Notice that 20 is not ambiguous, khana kha kər in this sentence refers only to mother, and not to the child as in 19. If the causative rule

were a postlexical rule, 20 should have been ambiguous, i.e., it should have been grammatical in the interpretation 20b as well. But, it is not. This again supports the proposal that the causative rule is a prelexical rule. The V-kər phrases in Hindi are probably derived from an embedded sentence, the embedding takes place only if the subjects of both the matrix and the embedded S-Verbs are identical.[11] Sentence 20 could not be interpreted as 20b, i.e., in a way which would identify the subject of kha as being bəcca, because in that case, the hypothetical underlying representation, leaving irrelevant details out, would be as follows:

$$S_o[X\ S_1[Y\ VP[_{Adv}[S_2[Y\ \underline{kha}]_{S_2}]_{Adv}SLEEP]_{S_1}CAUSE]_{S_o}$$

The prelexical causative rule will apply to (X(Y SLEEP)CAUSE). Subsequently, the adverbialization rule that yields V-kər phrases could only apply if the subject of kha is identical to the subject of the causative verb. In this case, the identity condition is not met, hence, the rule is blocked. On the other hand, 20 is grammatical in the interpretation 20a, because the underlying representation of the sentence, roughly, is as follows:[12]

$$S_o[X_{Adv}[S_1[X\ \underline{kha}]_{S_1}]_{Adv}\ NP[S_2[Y\ SLEEP]_{S_2}]_{NP}CAUSE]_{S_o}$$

The prelexical rule of causativization applies to (X(Y SLEEP)CAUSE). Next, the adverbialization rule that yields V-kər phrases applies as the subjects of the causative verb and the verb kha are identical.[13]

4.0 The process of causative embedding thus involves the following rules: a prelexical causativization transformation that via

predicate raising creates a constituent of the type (X(Y(Z VB)CAUSE) CAUSE) where X, Y and Z are participants and VB is the noncausative form of any V which is marked [+ causative], a subject raising rule that raises the NP corresponding to Z, and in subsequent cycle, the NP corresponding to Y to the next higher S, and case marking rules which assign proper case markings to NP's corresponding to X, Y and Z.[14]

Note that the prelexical rule of causativization in Hindi is obligatory, i.e., there are no grammatical paraphrases of causative sentences which keep the constituents of the semantic complex distinct on the surface. To ensure that an underlying representation such as (X(Y(Z VB)CAUSE)CAUSE) ends up in a grammatical sentence, the rule of causativization must apply recursively and a single lexical item, viz., the causative form of VB, must replace the resulting complex of semantic material. Notice also that the lexical insertion of the causative verb must precede the application of such cyclic rules as reflexivization, adjectivization, adverbialization, etc. Another topic in Hindi syntax provides evidence to support such a claim, namely, that lexical insertion of verbs must precede postlexical cyclic rules in Hindi. The topic is that of ko-sentences in Hindi mentioned in 1.0. But, before I discuss the evidence provided by ko-sentences, I would like to discuss in some detail the subtopic relating to the case marking of the NP's in causative sentences in Hindi. Some of the properties of verbs that play a crucial role in case marking but have not been discussed clearly are the following.

4.1 In my earlier work, I had posited two grammaticosemantic features, [ātmane] and [parasmai], to account for certain properties of compound verbs in Hindi (these will be referred to as [± atmane] in the following discussion). I had also pointed out that transitive verbs which are marked [+ atmane] and thus occur only with the operator lena have a first causal form which normally occurs with the operator dena (the operator dena does not occur with [+ atmane]) and, furthermore, that only those verbs which occur with dena have a (2nd) causal form. Note that all first causal (transitive) verbs derived from intransitive verbs share this property, i.e., they occur with dena and have a (2nd) causal form. The first causal forms of verbs are thus automatically [- atmane].[15] The subjects of all verbs that are marked [- atmane] (they may also be marked [+ atmane], i.e., they may be marked for both the features, but, what is crucial here is that they may not be marked only [+ atmane]) are, after the causative embedding, assigned the role of mediary agent and marked with the postposition se.[16] The animate subjects of [+ atmane] transitive verbs, however, are assigned the role of the recepient in the first causal (double transitive) and are marked with the dative postposition ko. The subjects of intransitive verbs function as direct objects of causative sentences, and if animate, are marked with the objective postposition ko. The subject of the highest verb is assigned the role of agent and is marked with the agentive postposition ne under appropriate contexts. The fact that only the subjects of [+ atmane] transitive verbs could function as recepients in causative

sentences is interesting. Note that the subject of a [+ atmane] verb combines the roles of agent and beneficiary both, hence, [+ atmane] verbs do not take a benefactive adverbial.[17] The indifferently marked verbs i.e. those marked [± atmane], may take a benefactive adverbial, as the subjects of these verbs do not combine the roles of agent and beneficiary. The subjects of these verbs assume the role of mediary agent in causative sentences as the subject of the higher verb is assigned the role of the controlling agent. The postpositions ko and se assigned to subjects of [+ atmane] or [± atmane] verbs in causative sentences thus signal an important semantic distinction.

4.2 Notice that the case assignment rules that assign the objective ko, the dative ko and the instrumental se are all relevant for other areas of Hindi grammars also.[18] The rule of subject raising is also independently motivated to account for certain constructions discussed under NP - Complementation.[19] The rule that crucially distinguishes the causative sentences from other complex sentences then is the prelexical rule of causativization which involves predicate raising. The rule operates on semantic material and creates a constituent which is later replaced by a lexical item.[20]

5.0 The ko-sentences of Hindi support the claim that the lexical insertion of the verb precedes other (postlexical) transformational rules. It has been argued that the animate NP's of sentences such as the following start out as the subject (not agent but victim or experiencer) but are later marked with the dative postposition ko as

recepients (Kachru 1970):

21. sītə ko ghər yəd əyə

'Sita remembered home.'

22. šer ko golī ləgī

'The bullet hit the lion.'

23. kəve ko bəhut pyəs ləgī thī

'The crow was very thirsty.'

With regard to reflexivization, the ko-sentences behave exactly the opposite of causatives; e.g. the following are grammatical sentences:

24. mujhko əpne bhaī pər bəɽa krodh əyə

'I got very angry with my brother.'

25. mohən ko əpne pər bhərosə nəhi həi

'Mohan does not trust himself.'

Notice that there are active sentences corresponding to 24 and 25 in which the NP's mɛ̃ and mohən are grammatical subjects (agents):

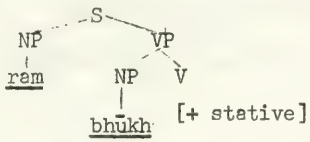
24a. mɛ̃ ne əpne bhaī pər bəɽa krodh kiyə

25a. mohən əpne pər bhərosə nəhī kərtə

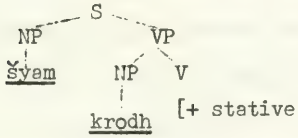
The reflexive əpnə in 24a and 25a is straightforward, 24 and 25 raise some questions. It is clear that the reflexivization rule applies before the animate subjects are assigned the role of recepients, otherwise, the identity condition will not be met and hence the reflexive rule will be blocked.[21] There is some evidence to support the claim that the lexical insertion of items such as ənə, ləgnə, honə as verbs in ko-sentences is conditioned by the verbal feature [+ stative] and also by features of abstract nouns such as bhūkh 'hunger', gussa

'anger', šərm 'shame', etc.[22] That is to say, the following underlying representations result in ko-sentences with stative verbs ləgna and ana respectively:

B




C




Notice that if the feature [+ stative] is replaced by the opposite feature [- stative] in C, the result will still be a grammatical sentence (viz. šyam ne krodh kiya as opposed to stative šyam ko krodh aya). In B, however, the feature [+ stative] is obligatory, there is no nonstative sentence *ram ne bhūkh kiya parallel to ram ko bhūkh ləgī 'Ram felt hungry'. This difference in the properties of ko-sentences with ləgna vs. ana (also hona) is determined by the features of abstract nominal complements (such as bhūkh vs. krodh) of these verbs. The lexical insertion of ləgna, ana, kərna, etc. precedes the postlexical transformational rules such as the psych-movement rule and the dative rule which mark the NP of S in B and C as recepient and attach to it the postposition ko. These rules operate on the above underlying representations only if they contain [+ stative] verbs, if they contain [- stative] verb kərna, the rules do not operate.[23] The marking rule and the dative rule follow the reflexive rule, therefore, sentences such as the following are grammatical:

26. sĩta ko əpna ghər yad aya

'Sita remembered her home.'

27. tumko əpnĩ hərkətõ pər šərm anĩ cahiye

'You should be ashamed of your actions.'

This analysis of ko-sentences in Hindi explains why 28 is grammatical but 29 is not:

28. mujhko uskĩ batẽ sun kər gussa a gəya

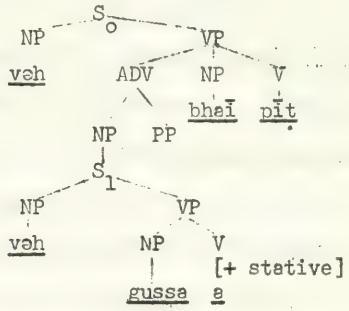
'Having heard his statements, I became angry.'

29. *(usko) gussa a kər usne bhaĩ ko pĩta

'Having become angry, he hit (his) brother

The hypothetical underlying representation of 29 is as follows:

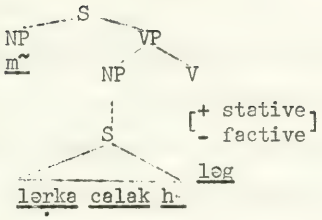
D



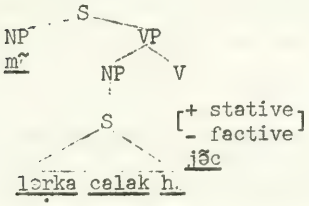

The lexical insertion of a is followed by the marking rule and the dative rule and as a result of these, the subjects of $S_o$ and $S_1$ are no longer identical, hence, the rule that embeds V-kər is blocked.[24]

5.1 The evidence to support the claim that the lexical insertion of stative verbs such as ana, ləgna, etc. precedes other syntactic rules is as follows. Both jãcna and ləgna take a sentential complement, i.e. the following underlying representations result in grammatical sentences:

E




F




The operation of complement-embedding, psych-movement and dative rules on E results in two grammatical sentences: mujhko ləgta hɛ̃ ki lərkɑ cɑlək hɛ̃ and mujhko lərkɑ cɑlək ləgta hɛ̃, whereas the operation of the above rules on F results in one grammatical sentence only: mujhko lərkɑ cɑlək jɔ̃cta hɛ̃. That is, although the semantic properties of ləgna and jɔ̃cna are identical, lexically, ləgna provides a choice between a ki-S complement and a complement that results from the application of the subject raising rule, jɔ̃cna only allows the operation of the subject raising rule.

6.0 To sum up the entire discussion, causative sentences in Hindi involve a prelexical rule of predicate raising, which is recursive. The lexical insertion of causative verbs, unlike in English, precedes other postlexical transformational rules in Hindi. The same is true of stative verbs that occur in ko-sentences. Grammaticosemantic features of verbs such as [+ atmənə] play a significant role not only in surface marking of NP's in causative sentences but also in assigning correct semantic interpretations to such sentences.[25]

NOTES

[1]Note, among others, the following: Bahl 1967, Balchandran 1971, Kachru 1965, 1966 and Sinha 1970.

[2]For a detailed discussion of some aspects of the syntax of ko-sentences in Hindi, see Kachru 1970.

[3]I shall use the term postlexical rule to designate any transformational rule that operates on a P-marker after lexical insertions have taken place.

[4]Krishnamurti 1971. The distinction Krishnamurti makes between the Performer/Experiencer agent and the agent who 'controls' the action, process, or event is important. Notice, however, that the specific arguments he presents against Balchandran's argument can not be justified. There is no natural way to block jĩ.jĩ ne munne ko rote - rote sulaya 'The elder sister put the child to sleep while he was crying' if causative sentences are accounted for by a postlexical causative transformation. It is interesting that Krishnamurti suggests that the embedding of rote - rote in the above sentences in its usual meaning follows the lexicalization of sona and caus. to sulana.

[5]Both Kleiman 1971 and Krishnamurti 1971 suggest that such sentences in nonperfective tenses are grammatical. This, however, is not quite true. The following, although in imperfective, is still ungrammatical:

a. *mɛ̃ dhobĩ se kəpre dhulvatā hũ̃, pər vəh nəhĩ dhota
'I get (my) clothes washed by the dhobi, but he does not wash them.'

Sentences such as the following require special interpretation:

b. mɛ̃ roṭiyɑ̃ bənatĩ hũ, pər ve bəntĩ nəhĩ

'I make Rotis, but they do not get made well.'

Notice the ordering of noncausal form of the verb with respect to the negative particle nəhĩ. In durative and future, such sentences are grammatical, as they involve action in progress and prediction respectively:

c. mɛ̃ bəcce ko sula rəha hũ, pər veh so nəhĩ rəha hɛ̃.

'I am putting the child to sleep but he is not asleep yet.'

[6]cf. Krishnamurti, op. cit. 27, 'The intended reading depends on the choice of other elements like the tense and aspect, quantifiers, punctual and durative adverbs, performatives, etc. and the presuppositions that flow from them'.

[7]According to Balchandran, pukarna basically has the case-frame A + D (op. cit. 103); hence lərka in 16 is marked Dative.

[8]Both Kachru (1965 and 1966) and Verma (1966) fail to mention this in their discussion of the adjectivization rule in Hindi. Notice that there are some cases where a past participial modifier cooccurs with an animate noun, e.g.:

(i) ghər se bhəgaĩ huĩ ɔrətɛ̃

'The women made to run away from home.'

(ii) mɑ̃ kĩ dekhĩ huĩ lərkiyɑ̃

'The girls seen by mother.'

In some sense, both bhəgana (causative of bhagna) and dekhna (transitive V) have 'special' meanings in the above phrases. bhəgana has

an extended meaning 'to elope with' and dekhna has an extended meaning 'to interview a boy/girl to determine his/her suitability for a matrimonial alliance.' In addition, the objects of bhəgana and dekhna (in such special senses) are indefinite, and though animate, are not followed by the postposition ko. This may indicate a [$^{-\text{ definite}}_{-\text{ animate}}$] feature assignment to nouns such as ɔrɔt, lərka, lərkī, bəcca, etc. in the context of some verbs. Notice that (b) would be preferable to (a) where lərkī is marked [$^{+\text{ definite}}_{+\text{ animate}}$]

(a) ? mɛ̃ ne ram kī lərkī dekhi

(b) mɛ̃ ne ram kī lərkī ko dekha

[9]Kleiman 1971. I shall not go into the details of her proposal here; I shall, however, build my arguments on the basis of her proposal.

[10]Sinha claims that the causative sentence in Hindi is an instance of NP - Complementation (op. cit. 32). If it were so, the structure A should yield a grammatical causative sentence in Hindi. But, it does not. Notice that in other cases involving NP - Complementation, the embedded S may be negative, as in mɛ̃ ne ram ko vəhɑ̃ nə jane ko kəha 'I told Ram not to go there.' Sinha views the causative construction as involving two rules, a zero-complementizer rule which is sensitive to the features [+ causative one] or [+ causative two] of Verb, and the causative rule which is sensitive to these features and replaces them with -a and -va respectively. The incorporation of V -a -va is achieved by a morphophonemic rule. (Sinha, op. cit. 32-36). The zero-complementizer transformation accomplishes the following: it attaches a zero to the embedded S to the left of all its constituents

and deletes its Aux. It is hard to see what motivates the zero-complementizer transformation. All the instances for which a zero-complementizer transformation has been proposed could be accounted for by the subject-raising rule. (Sinha's ye-replacement). Other rules such as the imperfective participle rule (Sinha p. 119) could accomplish the task of replacing one exponent of Aux. with another, under his framework, without much complication the causative rule as proposed by Sinha is of trivial nature and offers no explanation of the syntactic facts discussed in this paper.

[11]This is true of all sentences that contain a V-kər phrase. The only exceptions are expressions such as car baj kər dəs minət hue hɛ̃ 'It is ten minutes past four.'

[12]Whether the adverbial precedes the object or the object precedes the adverbial is not crucial to this discussion. The following is a paraphrase of 20 in the interpretation of 20a:

a. mɛ̃ ne khana kha kər bəcce ko sulaya.

I shall not discuss the basic order of constituents such as verbs, adverbials, objects, etc. in this paper.

[13]The counter-examples I have cited earlier to point out that Balchandran is not absolutely correct (sentences 3-6 in this paper) raise some interesting questions. Notice that the embedding of V-ta hua and V-a hua and also of the reduplicated present and past participials as adverbials does not depend upon subject identity. In this respect, the participials behave differently as compared with the V-kər phrases. As a consequence, at least for some speakers of

Hindi, jījī ne munne ko rote - rote sulaya is ambiguous. For those who do not have two interpretations of this sentence, probably the verbs of expression such as hõsna, rona etc. are marked for subject-identity for the purposes of the rules that yield participial adverbials. Verbs such as hõsna, rona, etc. are different from other intransitive verbs in various ways. Note that whereas there is a semantic distinction between cəl kər and cəlte hue, let kər and lette hue etc. ro kər and rote hue (also hõs kər and hõste hue) are usually interpreted identically, i.e., as manner adverbials only.

[14]It is not clear if an optional rule of 'agent creation' is needed to account for the causative sentences in Hindi (cf. J. Geis's proposal for English on the basis of data such as the following: John liquified the paraffin by heating it. Her proposal is that the subject of the inchoative verb is the sentence John heated the parafffin, after the operation of the 'agent creation' rule, the rest of the embedded sentence is extraposed as a by-phrase and John becomes the subject of the causative sentence). Kleiman (1971) suggests that this is plausible for Hindi on the basis of data such as the following:

(a) ram ke ag jəlane se panī ubla

'The water boiled because of Ram's lighting the fire.'

(b) ram ne ag jəla kər panī ubala

'Ram boiled the water by lighting the fire.'

It is true that every causative sentence may contain a V-kər phrase which semantically states the cause that results in the effect described by the causative verb. It is also true that for every causative sen-

tence such as (b), there is a paraphrase sentence such as (a) which is noncausative and which contains a NP -se phrase such that the NP is a nominalization of the S underlying the VP -kər of the (b) sentence. The relationship of NP -se and noncausative V in the (a) sentence is identical to the relationship of V -kər and causative V of the (b) sentence. This, however, is not enough evidence to assert that the subject of a causative verb is an embedded S. Notice that even noncausative verbs in Hindi may cooccur with similar V-kər phrases:

(c) mɛ̃ ne əxbər pəṛh kər jəna ki ram cunav mẽ jīt gəya

'I gained the information that Ram won by reading the newspaper.'

janna 'to know' is an inherently transitive verb in Hindi and it can not be causativized. It may be the case that janna itself is composed of complex semantic material and is inserted after the causativization rule has applied. I am, however, aware of no syntactic evidence to support such a claim at present. This question is still open for further research.

[15]This is not to deny that the first causal forms occur with lena. All I am claiming is that normally, the noncausative V + lena turns up as V + dena in the first causal, e.g. ram ne əngrezī sīkh lī. mɛ̃ ne ram ko əngrezī sikha dī. Most transitive verbs are marked, indifferently, as [+ atmənе] e.g. bəna lena, bəna dena, dho lena, dho dena, etc.

[16]Sinha wrongly claims that the subject of first causal is marked as dative in the second causal (op. cit. 35).

[17]Verbs such as khəna, pīna, sīkhna, pəṛhna, janna, pəhənna, oṛhna, kəmana, pana, socna, səməjhna, etc. are marked [+ atmənе]. janna, pana, kəmana, socna are marked [- causative]. Others, in

their causal form are marked [- atmane], and cooccur with dena. Notice that parhna and likhna require two dictionary entries each, one marked [+ atmane] and the other both [± atmane]. The evidence for this is in the following sentences:

(i) ram ne citthī parh lī

'Ram read the letter (for himself).'

(ii) ram ne citthī parh dī

'Ram read the letter out loud.'

(iii) *mɛ̃ ne ram ko citthī parhaī

(iv) mɛ̃ ne ram se citthī parhvaī

'I made Ram read the letter.'

(v) ram ne mujhse hindi parhī (*perh dī)

'Ram learnt Hindi from me.'

(vi) mɛ̃ ne ram ko hindi parha dī

'I taught Ram Hindi.'

Note that parh [± atmane] is equivalent to English 'read' and parh [+ atmane] is equivalent to English 'to learn, to study.'

[18]Independent of causative sentences, the objects of inherently transitive verbs may occur with the objective postposition ko. All animate objects of transitive verbs (pukarna 'to call,' bulana 'to invite,' etc.) and all inanimate objects marked [+ definite] take the marker ko. The same rule will assign ko to subjects of intransitive verbs that turn up as objects of first causal (transitive) verbs as it is sensitive to features such as [+ animate], [+ definite], etc. It could be argued that the same rule that assigns ko to animate

NP's in the ko-sentences of Hindi assigns the dative ko to subjects of [+ atməne] transitive verbs that turn up as recepients in the causative sentences. More on ko-sentences is said in section 5.0 of this paper. It may also be argued that the same rule that assigns instrumental se to the passive agent assigns se to the mediary agents in causative sentences. This will not be further discussed in this paper.

[19]For instance, sentences such as the following are derived by rules that include the subject-raising rule:

(i) mɛ̃ ne ram ko xuš dekha

'I saw Ram happy.'

(ii) lərkõ ne cor ko sẽdh kətte hue dekha

'The boys saw the thief breaking in.'

[20]Unfortunately, Hindi does not provide clear cut data to support the claims made by the hypothesis that causativization involves a prelexical transformational rule of the kind mentioned above. Even so, the indirect evidence provided by other rules such as reflexivization, etc. the apparatus suggested by Balchandran for the dictionary entry of causative verbs and the remarks made by Krishnamurti all point to some such hypothesis. A non-Indo-European language, such as Telugu, may provide better data to support the hypothesis. (cf. Krishnamurti's examples 20 a, b and c where he claims ' ... here, the reading of transitive verb is limited to "Agent Orientation" represented by what an Agent "does" to bring about an event, short of bringing it about.' (p. 28). Also, the paraphrase relation of

21a and b (p. 29) corroborate the claim that causative forms represent complex semantic material.) No matter which languages provide the most satisfactory data, even Indo-European languages such as English and Hindi have syntactive properties which point to the same explanation of the causative phenomenon.

[21]The identity condition for reflexivization specifies that the item to be reflexivized must be identical to the subject of the S at the point at which the reflexive rule applies, (cf. Subbarao 1967).

[22]Compare the following sentences.

(i) ram ko bhūkh lagī

'Ram became hungry.'

(ii) šyam ko gussa aya

'Shyam became angry.'

(iii) sīta ko šarm aī

'Sita felt ashamed.'

(iv) tumko daya kyõ aī?

'Why did you feel pity?'

It seems that abstract nouns denoting physical sensations of hunger, thirst, etc. contextually determine the occurrence of the stative lagna whereas the abstract nouns denoting emotional reactions such as anger, shame, pity, etc. determine the occurrence of the stative verb ana. There are no nonstative sentences parallel to (i) but there are nonstative sentences with karna parallel to (ii)-(iv), e.g.

(v) šyam ne (X par) gussa kiya

'Shyam was angry with X.'

(vi) kuch to šərm kəro

'Feel a little ashamed.' (a grammatical imperative)

(vii) ĩšvər səb pər dəya kərẽ

'May God take pity on all.'

[23]The rule that assigns the role of recepient to NP of S in underlying representations B and C does not involve any movement, unlike English where psych-movement involves moving the affected NP: nevertheless, there are two rules involved in Hindi, too, one that marks the appropriate NP as recepient, and the other that attaches the proper postposition to the NP thus marked. The same is true of the passive in Hindi as opposed to English. English passive involves moving the NP's, Hindi simply marks the agent as passive agent with se.

[24]The hypothesis that features such as [+ stative] determine the occurrence of verbs such as ana, ləgna, etc. and thus at least some ko-sentences are stative versions of parallel nonstative sentences with kərna does not account for total data of ko-sentences in Hindi.

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# SOME ASPECTS OF THE CAUSATIVE CONSTRUCTION IN HINDI

by

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May, 1971

The phenomena of Causativization in Hindi have been analysed by traditional grammarians as a straightforward process: grammarians have indicated the morphological changes that take place on a verbal root when the causative morphemes are attached to them, and have indicated the semantic shifts, if any, that sometimes take place when the causative morphemes are added to non-causal roots. Kellogg (1955:252), for example, states that from every primitive verb in Hindi a first and a second causal verb can be derived,[1] which express immediate and mediate causation, respectively, of the act or state signified by the primitive. He also gives two morphophonemic rules for the formation of the causal: the addition of -a- to the root of the primitive to form the first causal, and of -va- to form the second causal. He also discusses other changes that operate on the root because of the addition of the causative morphemes; these will not be gone into in this paper.

Greaves' analysis is more semantically oriented. He states (1933:271) that many verbs which may be causal in form are not causal semantically; thus, he says, for example, bənana 'to make' is not a causative semantically but an active transitive. In spite of these prefatory remarks, the rest of his exposition does not differ from that of Kellogg's.

The modifications in meaning that the causative morphemes bring about in the root, and the restrictions on causative formation will not be discussed further in this paper since these have been extensively treated in the literature.

This paper will investigate the nature of the causativization rule in Hindi, and its interaction with other rules of Hindi grammar. For this purpose, studies and proposals pertaining to this problem will be discussed in the first part of this paper; in the second part we will present an alternative analysis that, we believe, can account for the phenomena of causativization with semantic and syntactic accuracy.

The earliest analysis of causativization in the Generative Transformational framework is that of Yamuna Kachru (1965, 1966). In her proposal she is concerned with giving adequate structural representation to the roles that the noun phrases play in the causative sentences, and to the interaction of these roles in non-causal, direct causal, and indirect causal sentences. Thus, for example, in her (1965) formulation of the causative rule in Hindi she introduces the markers Recipient Noun and Mediant Noun, since Agent, Mediator, and Recipient interact in a very systematic way in causative sentences. This relationship can be schematized in the following way: (where the vertical line stands for 'becomes')

| | | | | |
|---|---|---|---|---|
| Intransitive non-causal: | | | Agent (surface agent) | |
| Direct causal: | | Agent | Object (recipient) | |
| Indirect causal: | Initiator Agent | Mediator | Object (recipient) | |
| Transitive non-causal: | | | Agent | Object |
| Direct causal: | | Agent | Recipient | Object |
| Indirect causal: | Initiator Agent | Mediator | Recipient | Object |

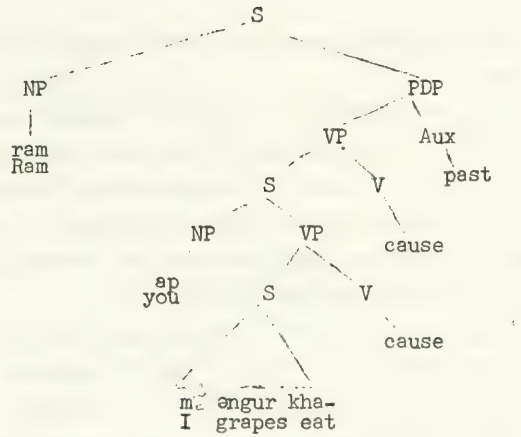
These facts seem to be indicative of a process of successive embedding in the formation of causatives, and this is the analysis proposed by Kachru. She maintains that causatives are instances of Verb Phrase Complementation, and that there is a Causative transformation that applies recursively. The relationship between

(1) mɛ̃ ne əngur khaye
I ate grapes

(2) ap ne mʊjhe əngur khɪlaye
You fed me grapes

(3) ram ne apse mʊjhe əngur khɪlvaye
Ram made you feed me grapes

can be captured in a straightforward way by proposing the following derivation for sentence (3):




The most relevant transformation that applies on the structure above is the Causative Verb formation, which attaches the verb of the most embedded S onto the causative verb of the structure immediately above. The transformation applies recursively, and the implicit claim seems to be that the rule applies cyclically. The transformations that operate on the NP's will not be discussed here.

The status of the type of complementation proposed by Yamuna Kachru for the derivation of causative sentences is doubtful. Analyses of English have tried to do away entirely with intransitive verb phrase complementation. The verbs which according to Rosembaum (1965) take such complements are very few in number, which is unusual, since one would expect their number to be as great, say, as the verbs taking sentential subject complements, especially since intransitive VP complementation is the simplest type of complement structurally. Lakoff (1965) has tried to account for such verbs as <u>endeavor</u> by postulating that these are transitive verbs which are marked in the lexicon as having to meet the structural description of the rule of It-Deletion. This means that these verbs must obligatorily be

followed by a sentence, which explains the ungrammaticality of

(4) *I endeavored it

According to Lakoff, then, the only difference between this verb and try is that one is marked with respect to the It-Deletion transformation while the other is not. Other verbs which were originally analysed as intransitives taking verb phrase complements have more recently been analysed as instances of sentential subject complementation by Lakoff (1967) and Newmeyer (1969).

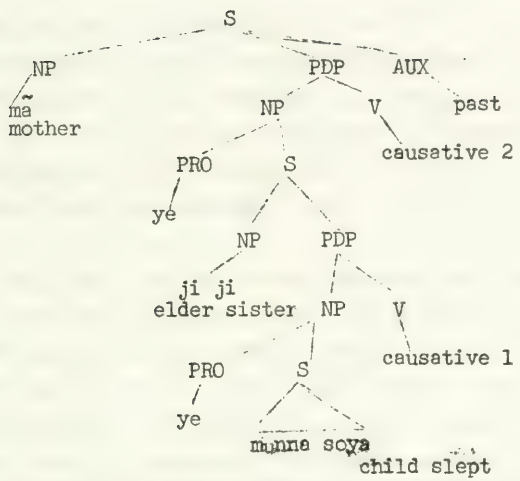
Robin Lakoff (1968, p. 17) has suggested that selectional restrictions of verbs with regard to the type of complement they can take are universal; she states that 'these selectional restrictions are part of the meaning of a verb; they will not change in time... Hence, it is likely that the selectional restrictions that determine whether a verb can occur with a complement subject or object are universal, since a meaning is universal'. If it were shown that all intransitive verbs can take only sentential subjects, for example, this view could perhaps be accepted since it is likely that transitivity and intransitivity are universal rather than language specific features, but as it is, there is no compelling evidence that this is the case.

Causative verbs have also been analysed as transitive verbs which take sentential objects as complements. This has been the analysis that Lakoff has proposed (1965).[2] Sinha (1970) adopts Lakoff's analysis in his treatment of Hindi causatives. He maintains that a sentence like

(5) mā ne ji ji se m nne ko s lvaya

Mother made the elder sister put the child to bed

is derived from the structure




The main argument that Sinha advances for postulating the above underlying structure is generality of description. Apart from the causative rule no new rules are needed in the grammar to derive the causatives. The transformations that are needed to derive the actual causative sentence are:

1. Zero complementizer transformation, whose application triggers the deletion of the auxiliary element in the embedded sentence.
2. ye-Replacement (It-Replacement, or Subject Raising as it is currently called) which, according to him creates the intermediate structures upon which the Accusative (ko-attachment) and the Dative (se-attachment) transformations can apply.
3. Causative transformation, by which the verb of the embedded S is incorporated into the causative and takes its characteristic morphophonemic features.

Sinha is not explicit about the ordering of the transformations he proposes. He considers sentences like (5) only, that is, relatively straightforward sentences where no other rules of Hindi apply. The ordering he seems to be specifying is Zero complementizer transformation before ye-Replacement; Nominative, Accusative, and Dative transformations

next, and then, after the principles of tree pruning have applied, the Causative transformation applies, first on the causative 1 sentence and then on the causative 2 sentence. Sinha does not discuss any of the transformations as to whether they are in the cycle or not, but if any of the transformations applying before Causativization is cyclical, it would follow that Causativization is a last cyclical or a postcyclical rule.

The Zero Complementizer transformation is not justified by Sinha, nor does he present any independent evidence that would justify it. He maintains that the choice of complementizer is determined by the verb in the matrix sentence to a large extent, but he also states that if the head noun of the complement sentence has the feature [ +Pro ] only Zero complementizer can occur; it seems then that both the verb in the matrix sentence and the head noun of the embedded sentence can determine the type of complementizer that will appear, and so there is no way to guarantee that they will not contradict each other.

Another set of verbs for which Sinha has postulated the Zero complementizer is that formed by the so-called conjunct verbs; unfortunately conjunct verbs are perhaps the most dubious instances of complementation in Hindi. The third class of verbs that according to Sinha takes Zero complementizer is that formed by verbs like ləgna 'seem', manna 'consider', in constructions like the following:

(6) mʊjhko lərka əccha ləga
to me boy good seemed

which, according to Sinha is transformationally related to

(7) mʊjhko ləga kı lərka əccha hɛ
to me seemed that boy good is

Yamuna Kachru[3] has pointed out that there is a clear difference between (6) which means 'I liked the boy' and (7) whose meaning is 'Iconsidered that the boy was good'. Sinha's implicit claim is then that transformations can change meaning, a claim that is not accepted

in some generative models of grammar.

Sinha's analysis has another drawback: it seems that in general, sentences with object complements can be paraphrased by sentences with the kɪ 'that' complementizer. This complementizer cannot occur however with either causatives or conjunct verbs, which means that both causatives and conjunct verbs are exceptional in their behavior and thus contrast with other verbs that take complex sentential objects.

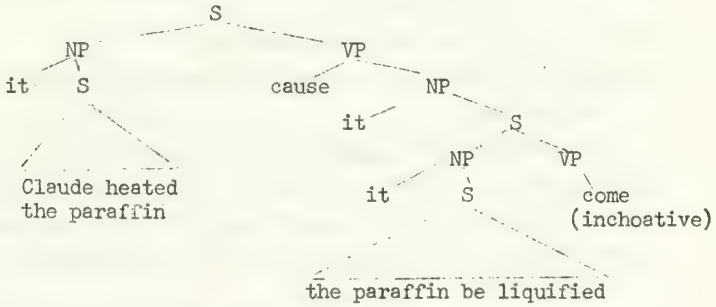
The next analysis that will be discussed also treats causatives as complex sentences with embeddings. Jonnie Geis (1970) claims that such English causatives as make, cause, bring about are sentential subject verbs. Such an analysis, according to her, can provide an adequate representation of the fact that only an act or a state of affairs, and not a person or an instrument per se can cause something to happen.

In this analysis, sentences like

(8a) Claude liquified the paraffin by heating it

(8b) Claude's heating the paraffin liquified it

have the following underlying representation:




According to Geis, the multisentence Deep Structure is supported by the fact that causative sentences can contain both a durative time adverbial (which usually cooccurs with statives) and an instantive time adverbial (which generally cooccurs with inchoatives). Thus in

English it is possible to say

(9) This afternoon Max liquified the paraffin for an instant.

The causative sentence would be derived through the application of an optional rule of Agent Creation which operates in the embedded sentential subject and makes it the NP of the whole causative sentence, extraposing at the same time the rest of the embedded S to the end of the sentence as a postposed by- phrase. There is evidence for a rule of that kind in the fact that by-phrases of this type occur only with predicates that are semantically causative,[4] as the ungrammaticality of (10) shows:

(10) *Jennifer seems to dislike Alice by laughing at her.

An interesting point in this analysis is that the noun phrase has somehow to be identified as agent or non agent for the correct formulation of the Agent Creation rule. This is similar to Hindi, where the role of the Agent is important for the formulation of several rules which interact with the causatives. Geis notices that in English it is impossible to say

(11) *John made himself indispensable to the gang by knowing the floor-plan of the building

derived presumably from the grammatical

(12) John's knowing the floorplan of the building made him indispensable to the gang.

In sentence (12) John is not a true agent. Geis solves the problem by stipulating that the verb must be [ -stative ] for the rule to apply, since there is no adequate way of stipulating what an agent is in the theoretical framework in which she is working.

Notice that sentences like

(13) ṣtov jəla kər ram ne pani ʃbala

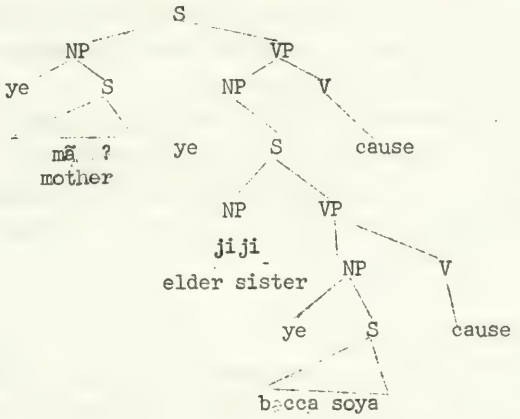
Turning on the stove Ram made the water boil

(14) ram ke ṣtov jəlane se pani ʃbla

Ram boiled the water by turning on the stove

are derived in the manner indicated by Geis, with not only a sentential

object but a sentential subject as well. Although we accept the claim that it is actions or states, not persons, which cause something to happen we will not represent structurally this claim in this paper, first, for the sake of simplicity, second, because it is not directly relevant to the topic of this paper, and third, because it is not clear what the embedded sentential subject will be like in those sentences where there is not an instrumental se-phrase in surface structure, as in sentence (5), which according to Geis' analysis would have the following underlying structure.




Notice that the sentential predicate in subject position would have a nebulous semantic content; the delimitation and restriction of these predicates is beyond the scope of this paper. So, in this article, the subject of a causative such as (5) will still be represented as a simple noun phrase with no embeddings, in spite of the semantic inadequacy of this representation. It should be kept in mind, however, that this is done for the sake of convenience and is not intended as a claim about the character of the subject of causative sentences.

All of the analyses discussed so far view causativization as an instance of complementation. We will now investigate briefly two proposals to analyse Hindi causatives as simple sentences.

Bahl (1967) proposes to expand a VP into Verb + Causal Morpheme, and to expand NP in such a way as to account for all cooccurrence restrictions between nouns and causals. For this an elaborate system of context sensitive rules and of strict subcategorization of nouns is proposed. It is possible that this system permits Bahl to account for the facts that he considers relevant, namely, to delimit the class of verbs which permit the causal morphemes in their expansion, but his extremely cumbersome expansion rules are almost equivalent to listing the forms which can occur with causals and fail to capture any generalization that might be made about causatives. Furthermore, the validity of context sensitive rules of expansion has been questioned by several linguists.

L. B. Balachandran (1971) has also maintained that causative sentences are simple sentences with no embeddings. The theoretical framework on which her analysis is based is that known as Case Grammar. In Case Grammar, the difference between the inchoative

(15) The ice melted

and the causative

(16) I melted the ice

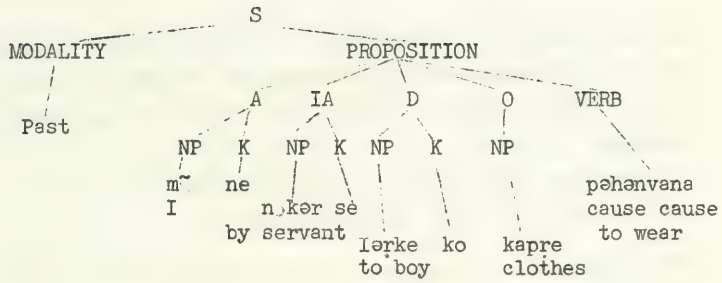
is explained in terms of the number of case relationships that are involved in each sentence. Sentence (15) has only the case category objective (ice) while (16) has both an agentive (I) and an objective (ice).

In the framework of Case Grammar, a sentence like

(17) mɛ̃ ne nɔkər se lərke ko kapṛe pəhənvaye

I made the servant dress the boy

has the following underlying representation:




(where K stands for 'case')

Balachandran objects to the treatment of causative sentences as instances of sentence complementation because of the numerous constraints that have to be specified for the structure of the embedded S in order to guarantee correct derivations. One of these constraints, she states, is that participial manner adverbials can originate only in the higher S, and not in the embedded S. Thus in sentence (18), for example,

(18) mɛ̃ ne rote rote bəcce ko sulaya

mother crying to boy cause to sleep

the adverb rote rote 'crying' can refer only to mɛ̃ 'mother', not to bəcca 'child'. This is unexplainable, she says, if we maintain that the causative sentence (18) is derived from a structure like (18a)

(18a) $[_S$ mɛ̃ $[_{NP}$ $[_S$ bəcca soya ] ] cause]

since there is no such restriction operating on the verb sona 'sleep', as sentence (19) shows:

(19) bəcca rote rote soya

The boy, crying, slept

We will consider this argument in greater detail later in the paper. The second argument that Balachandran advances has to do with restrictions on reflexive sentences. Evidence would seem to indicate that Reflexivization cannot apply on a sentence if this sentence is embedded under a verb of causation, a rather striking constraint in fact. Balachandran maintains that the rule of Reflexivization has

to be formulated with reference to a Deep Structure Agentive. Since in the derivation that she proposes for causatives there is only one Agentive, no constraints need to be imposed on Reflexivization, and sentences like

(20) *mɛ̃ ne lərke$_i$ko əpne$_i$ kapṛe pəhənaye
I made the boy$_i$ wear his$_i$ clothes

where the reflexive əpne is correferential with the objective lərka 'boy' will be automatically excluded, thus guaranteeing the only possible interpretation, namely, 'I made the boy wear my clothes'.

The third argument that according to her gives support to the claim that embedding does not take place in causative sentences is semantic. She states that sentences like

(21) mɛ̃ ne ʊse kɔi tərəh ki cizẽ dɪkhayĩ pər ʊsne ek ki bhi tərəf nəhĩ dekha
I showed him various things but he did not look in the direction of even one

should be anomalous if dɪkhana 'to show' were derived from cause and dekhna 'to see' since in the rightmost conjunct we are negating a predicate which is affirmed in the leftmost conjunct.

Balachandran proposes to capture the relationship between non-causals and causals by setting up case frames for the non-causal verbs from which the case frames of the causal verbs can be derived through some specific rules. For instance, a verb like khana 'to eat' would have the following basic case frame:

khana : A + O (Agentive, Objective)

and her rules would permit us to derive the following causative case frames:

khɪlana : A + D + O (Agentive, Dative, Objective)

khɪlvana : A + IA + D + O (Agentive, Instrumental Agent, Dative, Objective).

Let us consider now Balachandran's arguments in some detail.

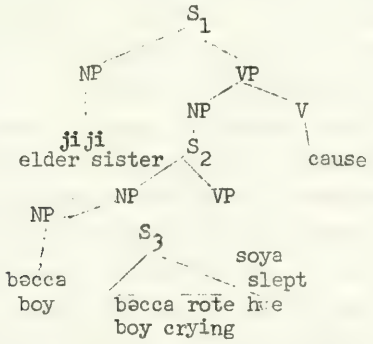
Krishnamurti (1970) discusses two of these arguments. With respect to the cooccurrence restrictions on participial manner adverbials, he claims that the facts noted by Balachandran can be handled by a transformational constraint that operates on the formation of manner adverbials, which would show that the constraint is independent of the causatives. According to him, if a sentence like (22)

(22) bacca rote hue
boy crying

is embedded, it can become the modifier of the verb in the higher matrix sentence only under identity conditions between the subject of the matrix sentence and the subject of the embedded sentence. He states that in a sentence like

(23) jiji ne bacce ko rote hue sulaya
The elder sister made the boy who was crying sleep

the identity constraint is not satisfied since the subject of the causative verb and the subject of sona 'to sleep' are not identical. If we consider the derivation of (23) in detail we will see that Krishnamurti has misunderstood the operations that take place in the sentence: [5]




Notice that the identity condition is satisfied: the subject NP of $S_3$ is identical to the subject NP of $S_2$ and therefore the process

of adverbial raising can take place, yielding the sentence that Krishnamurti wants to block. He failed to notice that the phrase rote hue is embedded directly under $S_2$ and not under $S_1$. Notice furthermore that even if rote hue were embedded directly under the causative verb, his transformational constraints would still have to be restricted to causatives only since it is possible to obtain sentences like:

(24) jiji ne bacce ko rote hue dekha
The elder sister saw the child crying

even though the subjects of dekhna 'to see' and the subject of rona 'to cry' are different.

Needless to say, Balachandran's claim that causative sentences are simple structures does not account for the restrictions she wants to explain since there is no restriction in Hindi specifying that only the subject NP (Deep Structure or Surface subject) of the sentence can contain a participial phrase, as sentence (24) indicates.

The restrictions that these two authors have assumed operate on manner adverbials are not based on correct data. Although the native speaker will assign the interpretation they claim is unique to sentence (23) more readily, the interpretation 'the boy was crying' is also possible. On the other hand, if we consider a sentence like

(25) nɔkər ne kutte ko həddi cəbate hue dəraya
servant to dog bone chewing caused to run

the most natural interpretation, and the first that the native speakers assign to the sentence is 'The servant made the dog which was chewing a bone run' rather than 'The servant, chewing a bone, made the dog run', which is the interpretation we would expect if the constraints pointed out by Balachandran and elaborated by Krishnamurti were indeed operative in the language. It seems that the speakers' presuppositions about the real world have a direct bearing on what interpretation these sentences will be assigned;

the phenomenon is semantic, and is not directly related to any constraints on causatives.

Krishnamurti also tries to deal with Balachandran's observations about the semantic structure of causative verbs. The former maintains that all transitive verbs should be marked as to whether they are agent or object oriented, or both. A verb is agent oriented when 'an agent does something to an object to bring about a state or event'. A verb is object oriented when 'something happens to the object as a result of the agent's activity whereby the intended state or event is brought about'. Causatives in Hindi, according to him, have only agent orientation, and this accounts for the fact that a sentence like

(26) mɛ̃ bəcce ko khana khɪlata hũ, phɪr bhi vəh nəhĩ khata
I feed the boy but he does not eat

is acceptable.

Krishnamurti maintains that these facts indicate that causatives must be analysed as complex structures; causatives are formed by a causative verb which is the carrier of the agent orientation feature, and an embedded verb which is the carrier of the object orientation marker.

Here again[6] the observations of both these authors are not entirely correct. While it is possible to say sentence (26), a sentence like (27) is ungrammatical:

(27) *mɛ̃ ne bəcce ko khana khɪlaya, phɪr bhi vəne nəhĩ khaya
I fed the boy but he did not eat

It seems counterintuitive to claim that causative sentences have only agent orientation in the imperfect tenses, but both agent and object orientation in the perfect. Whatever the feature is that makes (26) and (27) differ, whether it is a feature of agent and object orientation, or some feature of completion, it seems to me should be a marker of the aspect and not of the verb.

Balachandran's third argument has to do with the Reflexive rule in Hindi, as we have seen. Yamuna Kachru (1968) and K. V. Subbarao (1967) have noted that in a sentence like

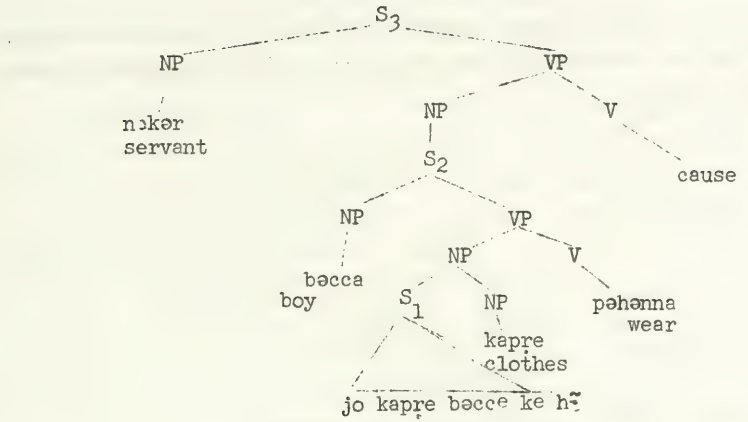
(28) $mæ̃_i$ ne bəcce ko əpne$_i$ kapre pəhnaye

I made the boy wear my clothes

the only interpretation is that which has been indicated, where əpne is correferential with $mæ̃$, and have suggested that in order to block the derivation where əpne is correferential with bəcca Causativization must apply before Reflexivization. Balachandran objects to this proposal stating that ordering is being used solely for the purpose of supporting a Deep Structure which she claims is wrong, but she offers no syntactic arguments for such rejection.

If we maintain that both Causativization and Reflexivization are cyclical rules, ordering Causativization before Reflexivization will not prevent the derivation of a sentence like (28) meaning 'I made the boy wear his clothes'. The hypothesis that rules apply cyclically means that all rules in the cycle apply first to the most deeply embedded sentence in the tree if the structural description of the rule is met. The rules operate in their prescribed order on the deeper sentence performing all those operations which can be performed within the sentence. After the cyclical rules have applied, the rules are reapplied to any sentence that dominates the structure which has been previously operated upon. Notice that Reflexivization is a rule that operates entirely within a sentence, while Causativization is a rule that operates between two sentences in that it takes an element from one sentence and makes it a part of a higher sentence.

Let us consider the deep structure of sentence (28), with the second, ungrammatical meaning, namely, 'I made the boy wear his clothes'.




The rules that are relevant for the derivation of the sentence are Relative Clause Reduction, Reflexivization, and Causativization. None of the rules can apply in the most deeply embedded sentence. We reapply the rules and Causativization again cannot apply since its structural description is not met. Relative Clause Reduction applies yielding

[ bəcca[ bəcce ke kapṛe] pəhənna]

and then Reflexivization applies yielding

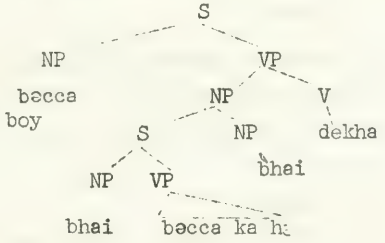
bəcca əpne kapṛe pəhənna

Relative Clause Reduction has to be ordered before Reflexivization for otherwise we would not be able to derive a sentence like

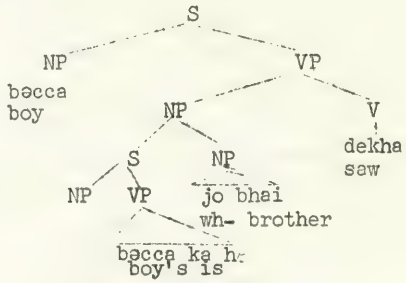
(29) bəcce ne əpne bhai ko dekha

The boy saw his brother

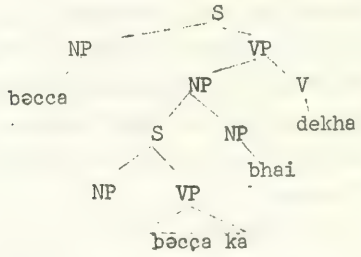
which has the following derivation:



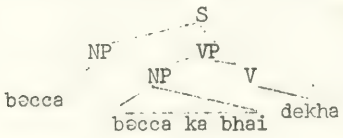
Reflexivization cannot apply since the two occurrences of bəcca 'boy' are not dominated by the same node S. Relative Clause formation applies yielding




After Relative Clause Reduction we obtain




After the tree pruning conventions have applied, the two occurrences of bəcca are dominated by the same node S and Reflexivization can apply to




yielding (29) after all relevant morphophonemic rules have applied.

Returning now to sentence (28), we proceed next to the sentence immediately above, $S_3$, and try to apply the rules again. Causativization applies, and we obtain the sentence

nɔkər bəcca əpne kapṛe pəhənaye

Relative Clause Reduction or Relativization cannot apply. After Subject

Raising and the case marking rules we obtain sentence (28) which should have been blocked but which comes from a grammatical Deep Structure and which has violated no ordering specifications.

There are three possibilities where the analysis above may be wrong: one, that Causativization is not cyclical, two, that Reflexivization is not cyclical, and three, that neither is cyclical.

Causatives are clear examples of recursive embeddings, so, if we maintain that Causativization is a transformation of the same nature as, say, Relative Clause Reduction and that it is in the cycle, we will derive ungrammatical sentences as we have seen above. If Reflexivization is cyclical, Causativization must be ordered not only before Reflexivization, but before the cycle as well. For these reasons it is worth investigating whether Reflexivization is in the cycle or not. Let us consider sentences like the following, which are ambiguous in Hindi:

(30) ram ne mohən ko əpne ghər jane ko kəha

Sentence (30) could have been derived from

(30a) ram ne mohən ko ram ke ghər jane ko kəha

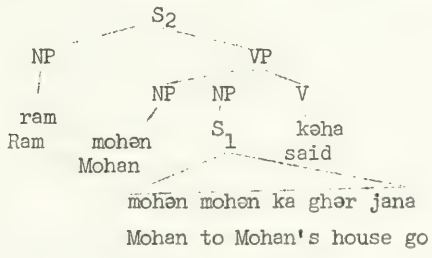
Ram told Mohan to go to Ram's house

or from

(30b), ram ne mohən ko mohən ke ghər jane ko kəha

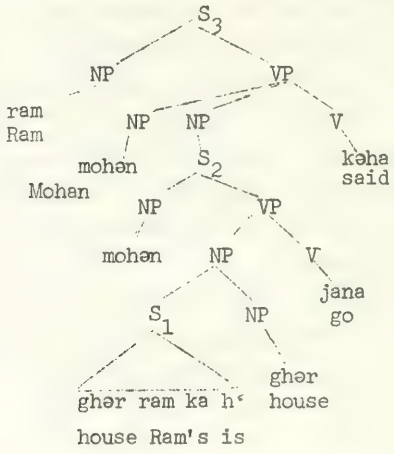
Ram told Mohan to go to Mohan's house

The deep structure of (30a), in a simplified form, is the following:

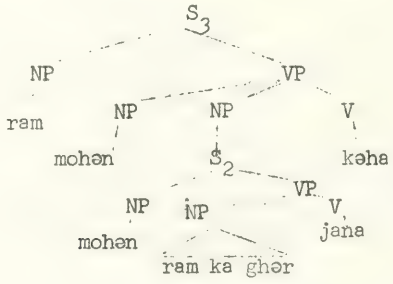


On $S_1$ the structural description of EquiNP Deletion is not met; only Reflexivization can apply in this sentence; we consider now $S_2$ and EquiNP Deletion can apply, yielding (30b). Notice that EquiNP Deletion, though ordered before Reflexivization, applies after this in sentence (30b) since otherwise the structural conditions for Reflexivization are lost.

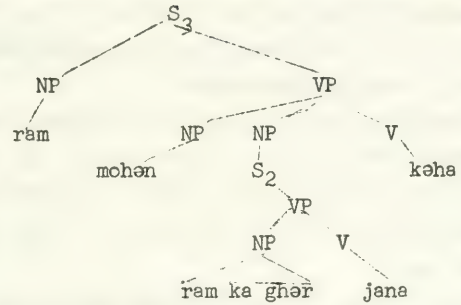
Sentence (30a) has the following Deep Structure;



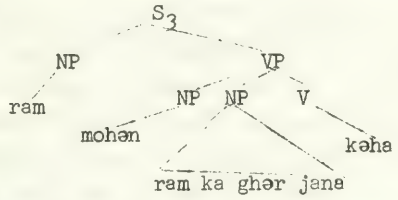

After Relative Clause formation and Relative Clause Reduction have applied, we obtain ( after tree pruning)



Reflexivization cannot yet apply. EquiNP Deletion yields




Only after EquiNP Deletion has applied, and the node $S_2$ has been pruned, the two occurrences of ram are dominated by the same node $S_3$:




Reflexivization applies, and after all relevant morphophonemic transformations have applied we obtain (30a).

Notice that in the derivation of (30b) Reflexivization must apply before EquiNP Deletion, for otherwise the structural description for Reflexivization will not be met once the embedded subject NP is erased under identity with the closest NP of the embedding sentence; in (30a), on the other hand, Reflexivization must apply after EquiNP Deletion for only then the second occurrence of ram will be dominated by the same node S. These ordering paradoxes indicate clearly that both Equi and Reflexivization are in the cycle, and that EquiNP Deletion is ordered before Reflexivization.

Sentences like

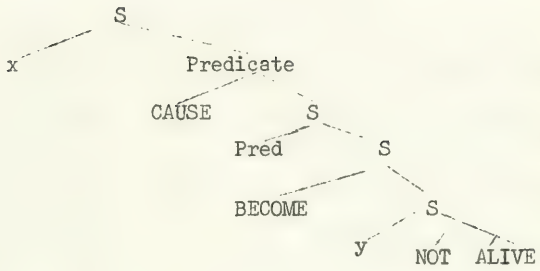
(31) trilok əpne apko bevəkuf mənta hɛ
Trilok considers himself stupid

indicate that Reflexivization is also ordered after Subject Raising, and presumably Subject Raising is in the cycle. Subject Raising is the rule Sinha claims interacts with the Causativization rule in the derivation of causative sentences.[7]

The constraints we have discussed indicate that Causativization must be ordered before the cyclical rules of the grammar. In addition to this feature of the Causativization rule that has been presented in this paper, there are further aspects of the rule that deserve to be investigated.

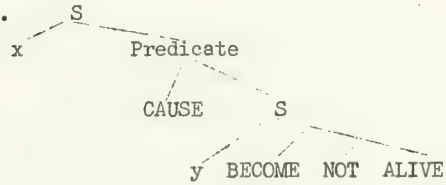
There is evidence that Causativization is not a lexical rule as the others we have discussed or mentioned in this paper. The main difference between English and Hindi Causatives is that in English we have surface structure evidence that the causative is complex not only in deep semantic representation, but throughout the derivation as well. In Hindi, on the other hand, the predicate of causation and the embedded verb are one lexical item in surface structure, and this is direct evidence that the causative transformation in Hindi is a prelexical transformation, that is, that the causative transformation applies to trees which terminate in semantic material rather than in lexical material. In English, too, there are cases of prelexical causativization rule, as in enable, break, etc., but there is no general morpholoLical device for marking causatives as in Hindi. A semantic structure such as cause to laugh is represented in the same manner in both languages, with the difference that in English there is no corresponding lexical item to replace such a configuration, so the derivation is blocked, whereas in Hindi the Causative rule can apply and after its application the lexical item hõsana replaces the constituent tree.

Causativization has been claimed to be a special case of the more general prelexical rule of predicate raising. McCawley (1968) has claimed that the rule of predicate raising operates on a structure like

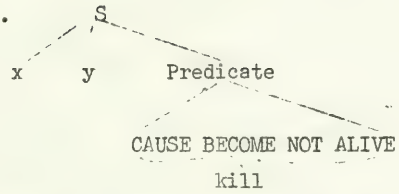



in the following manner

1.




2.




In the structure above, capital letters stand for semantic predicates, while small letters stand for lexical items, following the convention introduced by McCawley, Morgan, etc.

The assumption behind this approach is that lexical items replace constituents, and therefore there must be a rule that takes these predicates or constituents in the semantic representation of a verb and turns them into one constituent, which is what the Predicate Raising transformation accomplishes. The rule operates first in the most embedded predicate moving upwards; this means that there is more than one application of the rule in a given tree; on the other hand, the rule does not interact with any other rules in the grammar, and so,

even though recursive in its application, it may be ordered before the cycle. Hindi offers strong evidence that this prelexical rule is not ordered in the cycle; it also offers evidence that lexical insertion takes place immediately after the operation of Predicate Raising, or, before the rules in the cycle apply, since causatives behave as simple structures with respect to several other rules in the grammar, such as the Agentive and Participial Adjectivization transformations.[8]

In the literature, the rule of Predicate Raising has been regarded as an optional rule since it is possible to obtain such paraphrases of kill as cause to die, where Predicate Raising has not applied on the higher predicate. The transformation has to be considered as obligatory when applying on causatives in Hindi since there are no paraphrases that I know of for these sentences. Notice that the obligatoriness of the transformation seems to be quite general whenever the language has a morphological device that clearly indicates in surface structure the types of predicates that constitute the semantic representation of the item; thus in English, for example, cause to be able is generally realized as enable.

A general principle of semantic representations is that verbs can incorporate NP's as long as the NP is not a definite description containing a true referential index. Thus, for example, photograph may contain the NP's picture and perhaps somebody, but it cannot contain a specific NP; it is unlikely that there will be in any language a word meaning take a picture of Peter; similarly, although a lexical item meaning criticize the president might exist or be created in a language, it is unlikely that an item like criticize Johnson might exist.[9] This excludes the possibility of deriving the causative pəhənvana, for example, from the semantic representation

cause x to make y to wear y's clothes

or something similar. In postulating that the Causative transformation in Hindi is prelexical we are maintaining that the constituent structure of a causative verb is invariable, that is, the only predicates for,

say, pəhənvana, is

x cause y cause z to wear;

if another element is present at the point the Causative Transformation applies, this structure will not then coincide with the dictionary entry for pəhənvana and the transformation will be blocked.

Notice that certain facts about Hindi causatives and negatives that have worried scholars are automatically explained once we accept the claim that the Causative transformation is prelexical. A sentence like

(32) mɛ̃ ne jiji se bəcce ko nəhĩ sulvəya

Mother did not make the elder sister put the child to sleep

has only one interpretation, namely, that in which nəhĩ 'not' negates the whole structure x cause y cause z sona. In other words, sentence (32) cannot be derived from

x cause y cause z nəhĩ sona

nor from

x cause y nəhĩ cause z sona

since the rule of Predicate Raising will be blocked if the predicates are raised over a negative. Notice that in cases of embeddings where the terminal nodes are lexical rather than semantic, as Hindi scholars have maintained is the case of causatives, there is no restriction about negating the most deeply embedded verb, as in

(33) mɛ̃ ne usko ghər nə jane ko kəha

I told him not to go home.

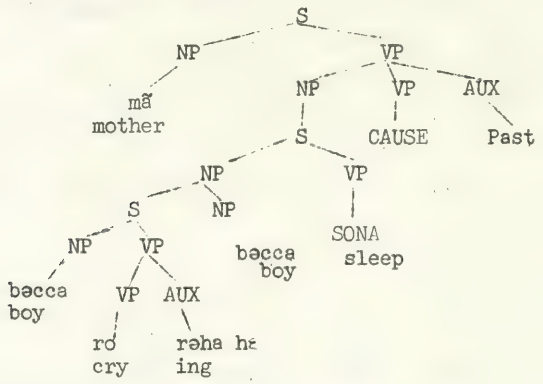
A sentence like (33) is parallel in structure to sentence (32) in all the analysis of causatives that have been proposed so far that consider causatives as instances of sentence embeddings. Researchers were therefore forced to claim that causatives were exceptional with respect to negation, whereas in the analysis proposed in this paper the problem does not arise at all.

We will now present a step by step derivation of a causative sentence based on the approach that has been discussed above. Let us

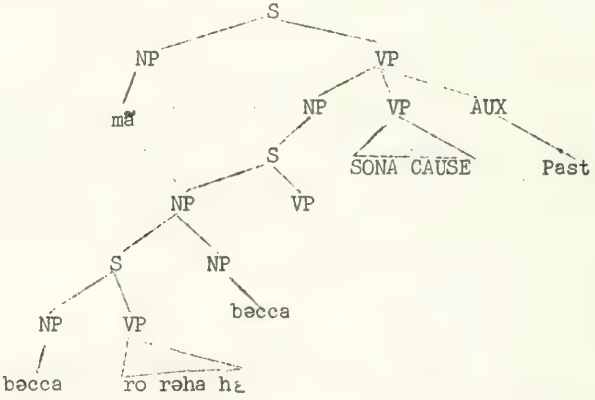
consider the sentence

(34) mã̃ ne rote hue bəcce ko sulaya

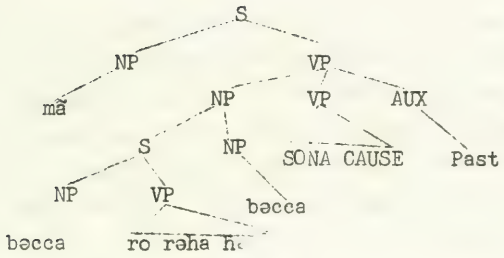
Mother made the crying boy sleep



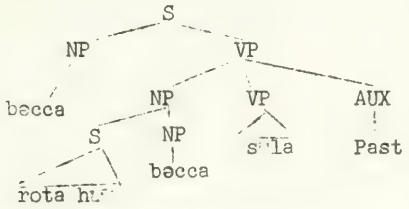

After Predicate Raising we obtain




After the tree pruning conventions, the structure would look like the following:




After lexical insertion, where the lexical item sulana replaces the constituent sona cause, the Adjectivization rule can apply next yielding




We see that Predicate Raising applies first, that is,the whole tree is scanned looking for those nodes ending in semantic material; all other relevant transformations apply later. The proposal advanced here needs more elaboration and investigation, especially of those phenomena which arise when the Causative rule interacts with other rules, but it seems to me that the claim that Causativization is a prelexiczl rule which applies before the cyclical rules operating on lexical material is basically sound. This claim, together with certain facts of Hindi grammar indicate that some of the assumptions that have so far been made about prelexical rules need much more detailed investigation. Particularly important is a study of the assumption that the rules operating on subtrees of semantic representation are ordered together with other lexical rules of the grammar.

The analysis we have proposed for Hindi is consistent with the semantic and syntactic phenomena that are characteristic of causative

sentences. Semantically, it enables us to represent the relationship between non-causal, direct causal, and indirect causal sentences. The relationship between the NP's of these sentences was not investigated since the proposals of Yamuna Kachru, Sinha, and Balachandran account for this satisfactorily..In particular, the framework of Case Grammar permits the structural representation of these phenonema in an adequate and insightful way.

The proposal is sound syntactically because the basic assumptions concerning the semantic representation of causatives and the ordering relationships of these and other rules are consistent with the facts noted about Reflexives and Negation in Hindi causative sentences.

## Notes

* Paper presented in the course 'Structure of Hindi' (Linguistics 303; Fall 1970), Department of Linguistics, University of Illinois, Urbana, Illinois.

I would like to thank Yamuna Kachru, Jerry Morgan and K. V. Subbarao for their comments and helpful discussions on an earlier version of this paper. Tej K. Bhatia, Yamuna Kachru and K. V. Subbarao have helped me in verifying my data.

1 Kellogg's statement is not exactly true. Yamuna Kachru (class lectures) has characterized a set of verbs that cannot undergo Causativization.

2 Lakoff has also discussed this problem in the article 'Verbs of Change and Causation', but I was unable to consult it.

3 Notes from her class lectures.

4 This is not completely true since we find sentences like the following:

John learned French by reading Baudelaire
John discovered the answer by going through the whole book

where we would be forced to claim that verbs like learn, discover, report, etc., are causatives. So, more rightly, causatives seem to form a subset of a larger class of verbs, the properties of which are still undefined. I am grateful to Jerry Morgan for having called my attention to these sentences.

5 These derivations and others in the paper are presented in a simplified form, unless a step by step derivation is absolutely essential for the argument; for a somewhat more detailed derivation of participials see Kachru (1966).

6 Yamuna Kachru pointed out these facts to me.

7 We have not considered in detail the claim that the structural description of Reflexivization must refer to a Deep Structure subject. Greaves (1933:179) makes a similar claim with respect to surface subjects. He maintains that the genitive reflexive apna is generally correferential with the subject NP of the main verb.

and although he cites counterexamples, he states that this rule is general enough to accept its validity. Lakoff (undated) has claimed something similar in his discussion of English pronominalization rule. He states that a subject - nonsubject distinction must be specified in the rule in order to insure the correct outputs. Furthermore, he presents evidence that there are a number of constraints that have to be postulated, but which are not part of the rule of Pronominalization itself but are output conditions, that is, conditions of well-formedness in surface structure.

Reflexivization in Hindi is in general quite predictable, and only its behavior with causatives would motivate an investigation to determine whether Lakoff's claims about anaphoric processes in English are parallel to claims that could be made about the process of Reflexivization in Hindi.

8 Note that McCawley argues that in English lexical insertion does not take place immediately after prelexical transformations have operated. He attempts to show, for example, that transformations that have been regarded as cyclical and as operating on lexical matter apply before lexical insertion takes place. This is the case, he states, of Reflexivization and EquiNP Deletion.

9 See Morgan (1968).

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# A DEVERBAL ANALYSIS OF ADVERBIALS IN HINDI

by

MARGARET STEFFENSEN

January, 1971

I. Background

There have been a number of attempts to adequately describe adverbs within a transformational framework. In Aspects of the Theory of Syntax (1965:101) Chomsky handles adverbials in three Phrase Structure rules:

Pred Phrase ---→ Aux + VP (Place) (Time)

VP ---→ V (NP) (Prep Phrase) (Prep Phrase) (Manner)

Prep Phrase ---→ { Direction, Duration, Place, Frequency, etc. }

No provision is made for the co-occurrence restrictions on the majority of verb-adverbial pairs. In describing the sentence:

1. He decided on the boat on the train.

Chomsky (ibid.) says that "the second Prepositional Phrase is simply a Place Adverbial, which, like a Time Adverbial, has no particular connection with the Verb. However, selectional restrictions between Time Adverbials and Verbs are necessary, as shown by the following sentences:

2. *He died ever since March.

3. *He read the book at midnight.

In the first sentence, the verb requires an instantive adverb, while the second example requires a durative one. There is no obvious way the restrictions which are necessary can be stated, within the Aspects framework, without drastically revising the concept of strict subcategorization or selectional features.

Furthermore, the Phrase Structure rules as Chomsky has expanded them include a number of categories which are now being challenged: Aux, Prep Phrase, and the adverbials.

Recently, there have been more interesting approaches to this class of structures. Mary Gallagher (1970) has suggested that there is no category of Tense in the Phrase Structure rules in English. Instead, the expansion rules may generate an adverb of time, and this adverb dictates the morphological signs on the verb. The advantages of this analysis are:

(1) English would no longer be a rather exceptional language in that it has Tense as an obligatory category.

(2) It avoids the problem of erasing a meaning-bearing element in Relative Clause Reduction, as demonstrated by the sentence:

4. The evil man lived in a state of terror.

If Tense is a necessary expansion, this would have to be derived from:

5. The man who { is / was } evil...

In Gallagher's analysis, there would be no adverb of time, and therefore no tense would be present that would have to be deleted by a meaning-changing transformation.

(3) Certain selectional restrictions can be explained. The non-occurrence of statives in commands is a result of the fact that statives will not take time adverbials, but commands require a future time.

Mike Geis (1970) has discussed before, after, until and since as derived from verbal constituents. He posits a deep structure which is closer to the semantic content of the surface sentences containing these lexical items. Sentences with before and after are derived from a sequence of the form:

6. at a time which was { earlier / later } than the time at which

The fact that before and after can be modified by measure phrases and

will undergo comparative deletion supports this analysis in which comparatives do show up. Until and since do not act like comparatives and can not be pronominalized. Their behavior can be better understood if they are derived from aspectual verbs like end and begin, in structures such as:

7. all during the time that { began / ended } at the time at which

This deeper level of analysis has greater explanatory power than a more superficial one does.

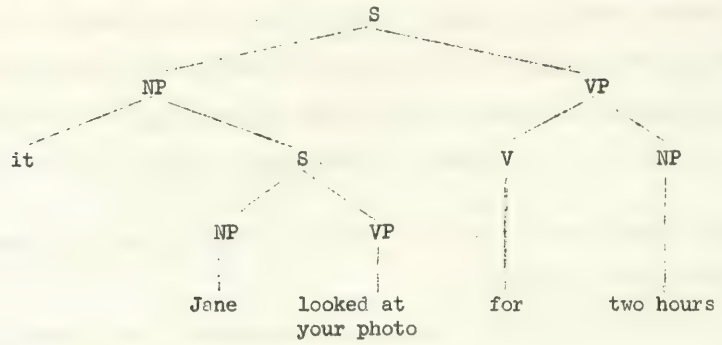
These publications indicate the direction of development. The most comprehensive study to date is Jonnie Geis's doctoral dissertation (1970) in which she studies all types of adverbials and posits a highly abstract analysis. I wish to apply this approach to Hindi since it is well-motivated and sheds some light on previously unresolved problems. I will consider Geis's motivations, applying them to Hindi to see how general they are, and will then consider some arguments that could be leveled against this description of Hindi. In the final section, I will examine A. C. Sinha's presentation of about, ke baare mẽ, and show that more interesting insights can be gained through a deverbal analysis of this structure.

## II. Introduction

In this analysis, an adverb is posited as a verbal element in deep structure which is higher than the main verb, i.e., the verb which appears in surface structure. Thus even a simplex sentence (at surface level) with an adverbial contains at least one embedding. A sentence such as:

8. Jane looked at your photo for two hours.

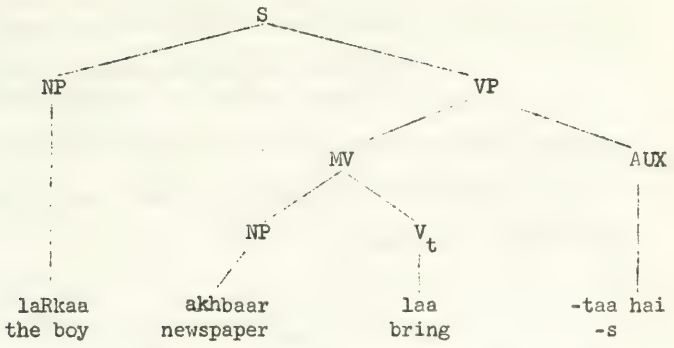
is diagrammed by J. Geis as (1970:57):



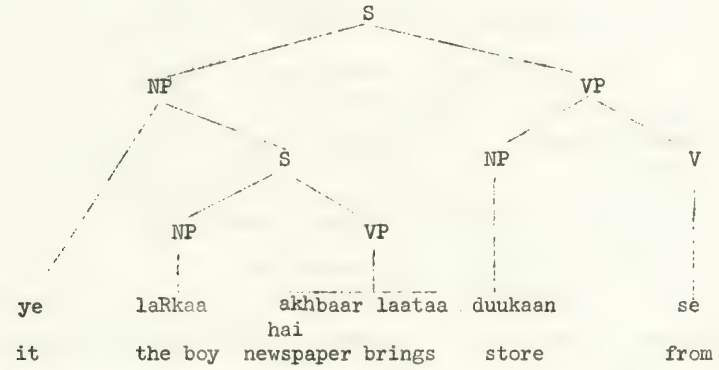

This is an interesting structure because it explains, in a deep theoretical sense, why an SOV lnaguage such as Hindi has postpositions rather than prepositions. Greenberg (1963), in a surface analysis of a number of languages, has pointed out that this is overwhelmingly the case. If we examine the expansion rules proposed by Y. Kachru (1966) in conjunction with the analysis given by Geis, it is immediately obvious why this is so. A sentence such as:

9. The boy brings the newspaper.

would have the following structure in Hindi (Kachru, 1966:39):




Dropping, for the moment, the now-controversial AUX node, when an adverb is added, the tree would be:




Although the Adverb Lowering Rule would be slightly different from that in English, insofar as the adverbial VP would be embedded before, rather than after the V node, the order within the VP constituent would be preserved. Thus the occurrence of postpositions is the logical result of the Phrase Structure Rules.

It has been pointed out that in English this type of tree can be supported by sentences of the form:

10. It is from the shop that the boy brings the newspaper.

However, there are no sentences in Hindi of the same form:

11. * ye duukaan se hai ki laRkaa akhbaar laa -taa hai.
it store from is that boy newspaper bring -s

While this is true, it is important to consider the following facts:

(1) English has a number of sentence forms in which a dummy subject is followed by a copula:

12. It's nice today.

13. It's (raining / snowing) etc.

In Hindi, sentences of this type are deviant:

14. *aaj ye baarish ho rahii hai
today it rain -ing is

15. * ye aaj acchaa hai.
it today good is

The above sentences must be expressed with real subjects:

14a. aaj baarish ho rahii hai.
today rain happen -ing is

15a. mausaam aaj acchaa hai.
weather today good is

This suggests that there is a general distinction between the two languages as to what can occur as a surface subject.

(2) In English, focus is possible without the dummy subject followed by the copula as well as with this structure:

20. It is from the shop that the boy brings the newspaper.

20a. From the shop, the boy brings the newspaper.

These are equivalent to sentences in Hindi in which the locative is moved to the beginning of the sentence and thereby becomes the focus:

21. duukaan se laRkaa akhbaar laa -taa hai.
store from boy newspaper bring -s

This would indicate that in English, the grammar can either delete the it and generate the sentence which is comparable in structure to the Hindi sentence, or the copula may be inserted, thereby allowing the deep structure it to remain in surface structure. In Hindi, only the former is possible:

22. From her own house, she brought the gift.

apne ghar se wo tofaa laayii.
own house from she gift brought

23. In the evening, he will go to a hotel.

shaam ko wo hoTal jaaegaa.
evening in he hotel will go

This is also related to the surface constraint covering possible subjects, mentioned above.

(3) When a sentence with an adverbial is negated, it is ambiguous. This ambiguity is the result of two different deep structures, one in which the negation has as its scope the Main Verb (the lower sentence), the other in which the scope is the entire proposition (the higher sentence). In a sentence such as

24. The boy didn't bring the newspaper from the store.

negation of the Main Verb can be paraphrased:

24a. From the store, the boy didn't bring the newspaper.

while sentence negation is equivalent to:

24b. It is not the case that the boy brought the newspaper from the store.

This reflects the fact that the truth conditions for (24) can be met either if the boy fails to bring the newspaper or if he brings it from some other place. In no case does negation have only the adverbial in its scope. The same ambiguity exists in the Hindi sentence:

25. laRkaa duukaan se akhbaar nahĩĩ laayaa.
boy store from newspaper not brought

In negative responses to yes/no questions, the same behavior occurs. In either language, a short negative response does not specify what the scope is. Thus the following answer does not make clear whether the girl didn't bring vegetables at all, or if she brought them from somewhere other than the market:

26. Did the girl bring the vegetables from the market?

26a. No, she didn't.

27. kyaa laRkii baazaar se tarkaarii laayii?
question word girl market from vegetables brought

27a. jii nahĩĩ.
no

Note that these two types of ambiguity can be resolved by specifying the adverbial as the focus:

28. It wasn't from the store that the boy brought the newspaper.

29. Was it from the market that the girl brought the vegetables?

The same method of disambiguation exists in Hindi:

30. duukaan se laRkaa akhbaar nahĩĩ laayaa.
store from boy newspaper not brought

31. kyaa baazaar se laRkii tarkaarii laayii?
question word market from girl vegetables brought

In both languages, focus can also be achieved with regular word order and heavy stress on the appropriate constituent.

Although English does conform more closely to the posited deep structure, the advantages of a deverbal analysis of adverbials are equally great in Hindi, as I will show in the following sections. A theoretical construct which has explanatory power should not be rejected

because of superficial language differences. Although the area of focus needs extensive work, it seems that the differences in behavior between the two languages can be handled by a surface level constraint related to the feature markings on the deep structure it. The following arguments, as well as the explanation for the occurrence of postpositions, seem strong enough to support this position.

III. Motivation for the Analysis

(1) In many respects, at a surface level, adverbials are like transitive verbs. They are both followed by an NP and exhibit co-occurrence restrictions between the verb and the noun phrase:

32. The boy was talking to the girl in a house.
*an idea.

33. laRkaa laRkii se {ghar mẽ / *khyaal mẽ} bol rahaa thaa.
boy girl with {house in / *opinion in} talking was

34. The boy was sitting with the girl on {the sofa. / *the plan.}

35. laRkaa laRkii ke saath {sofe par / *yojnaa par} baiThaa tha.
boy girl with {sofa on / *scheme on} in the state of sitting was

In Hindi, as in English, these co-occurrence restrictions should be stated on the function word rather than the noun since the latter can occur in many other environments besides before a postposition. If the restrictions were stated on the noun, they would have to be optional, making them highly unusual since they are typically obligatory. Furthermore, the statement of these restrictions would be much less parsimonious if placed on the noun since there are many more nouns than function words

in the two languages (J. Geis, 1970:18).

There would have to be some way of guaranteeing that if a postposition appeared in the deep structure, one of the optional noun features were chosen since a postposition does not occur alone. This would also be an unusual formalism.

If the decision is made to state selectional restrictions on the postposition, and an underlying verb is not posited, an explanation must be given for the fact that the same features of nouns are significant for both verbs and postpositions: [± concrete, ± abstract ...] (J. Geis, 1970:20).

(2) Various processes support this analysis of postpositions as derived from higher verbs. Verb Phrase Deletion is the rule which deletes the second occurrence of a verb phrase under identity. In the following examples, the second clause is understood to include a VP which is a duplicate of the first:

36. Max likes kosher dills, and I do too.

37. Helene drinks beer every Saturday, but Harv doesn't.

This process also occurs with prepositions:

38. Max slept for three hours, but I read.

39. Hildegard was eating in the living room and Jack was playing his ukelele.

The fact that the adverbial has been deleted is shown by the following sentence:

40. *Mary left at exactly midnight but I read War and Peace.

This deviance is caused by a violation of co-occurrence restrictions between an instantive preposition, at, and a non-progressive, continuing activity

verb, read.

In Hindi, as in English, both verb phrase and adverbial deletion occur. Verb Phrase Deletion in Hindi is somewhat different from that in English, but both postpositions and verbs behave in the same way. This is what one would predict within this theoretical analysis. In English, where there is Verb Phrase Deletion, there is always either a PRO-verb form or part of the underlying structure left behind (depending on whether one accepts Ross's analysis involving higher sentences). In Hindi, there is no such form:

41. Sheila likes coffee and Sarala does too.

shiilaa ko kaafii pasand hai aur saralaa ko bhii.
Sheila to coffee pleasing is and Sarala to also

The following are examples of deleted adverbials:

42. I was studying in the library and Sheila was writing a letter.

mãĩ laaibrarii mẽ paRh rahaa thaa aur shiilaa ciTThii
I library in study -ing was and Sheila letter

likh rahii thii.
writ -ing was

43. I was reading for five hours and John was writing a letter.

mãĩ pããc ghaṆTõ tak paRhtaa rahaa aur jaan ciTThii
I five hours until reading kept and John letter

likhtaa rahaa.
writing kept

In both of these sentences, the second clause is understood to include the adverbial which is present in the first.

As in English, a deviant sentence is generated if an instantive time adverbial is combined with a stative or non-progressive continuing activity verb:

44. *I will go out at exactly four o'clock and John will read a book.

*mãĩ Thiik caar baje nikluugaa aur jaan kitaab paRhegaa
I exactly four o'clock will leave and John book will rea

45. *I met Prakash yesterday and he was thin.

*mai Prakaash se kal milaa aur wo dublaa thaa.
I Prakash with yesterday met and he thin was

(3) In English, a sentence such as the following is ambiguous:

46. I read in the library for ten hours and Rachael wrote a paper.

This can mean either that Rachael wrote a paper in the library for ten hours or that she worked on the paper for ten hours elsewhere. That this is the case is shown by the grammaticality of the following:

47. John swam in the pool for thirty minutes and Susan wrote letters.

These two activities clearly do not both occur in the pool, but the time duration is the same. The sentence is not ambiguous, due to the semantic constraints.

The same type of behavior occurs in Hindi sentences involving double adverbials:

48. I studied in the library for three hours and my friend wrote a paper.

tiin ghãTõ tak laaibrarii mẽ mãĩ ne kitaab paRhii
three hours until library in I book studied

aur mere mitr ne lekh likhaa.
and my friend paper wrote

49. I read a newspaper in my room for some time and my friend read a story.

kamare mẽ kuch der tak mãĩ ne akhbaar paRhaa aur
room in some time for I newspaper read and

mere mitr ne kahaanii paRhii.
my friend story read

Notice that in these conjunct sentences where there is a "heavy" adverbial phrase, the adverbial preposing rule is stylistically preferred.

As in English, semantic constraints prevent ambiguity:

50. John swam in the river for one hour and his wife slept.

jaan nadii mẽ ek ghaNTe taira aur us kii patnii soii.
John river in one hour swam and him of wife slept

(4) Another process which supports this analysis is Object Deletion. In English, certain transitive verbs can lose their objects:

51. She sang ∅ for two hours.

52. He eats ∅ at 10:00 every night.

The understood object is a generic term rather than a specific one. This can also occur with certain prepositions, which is what would be expected if they are analyzed as transitive verbs:

53. The ocean must be near ∅: I see a lot of seagulls.

54. The doctor isn't in ∅.

Object Deletion also occurs in Hindi:

55. Ram eats every day.

raam har roz ∅ khaa taa hai.
Ram every day eat -s

56. She was singing.

wo ∅ gaa rahii thii.
she sing -ing was

There is an equivalent operation in the case of the postposition. In Hindi, one can say:

57. Is the doctor in his office?

kyaa DaakTar daftar mẽ hãĩ?
question word doctor office in is (honorific)

However, if one optionally deletes the object, the postposition must obligatorily be deleted:

58. Is the doctor in?

DaakTar hãĩ?
doctor is (honorific)[1]

The process of Object Deletion is less common in Hindi than it is in English, in regard to both verbs and adverbials.

In Hindi, there is no trace of the verb in the case of Verb Phrase Deletion, and the same type of process occurs in the case of Object Deletion. There is a high degree of consistency in behavior, greater than chance would predict. There is no violation of Chomsky's recoverability constraint because the context supplies the deleted constituents. In English there is a PRO-form left in the case of Verb Phrase Deletion and, in Object Deletion, the verbal remains. English thus seems to require some surface verbal in the case of both verbs and adverbial phrases, while Hindi does not.

(5) The type of pronominal objects which can occur with transitive main verbs and adverbials in English supports the theory that they are the same in underlying form. J. Geis lists the following verbs which can take an adverbial form, such as <u>there</u>, as well as the more usual pronominal form, <u>it</u> (1970:23). I personally feel that the sentences with the adverbial PRO-form are only marginally acceptable, but this is the data as she reports it:

60. She was approaching the city in an airplane and he was approaching { it / there } in a taxi.

61. Some fans were entering the sports arena and others were leaving { it. / there. }

The same thing occurs with prepositions: some may occur with adverbial PRO-forms as well as nominal ones (Geis, 1970:20):

62. The bandits were hiding beyond the river, but the posse was afraid to ride beyond { it. / there. }

This does not occur with all prepositions, just as it does not occur with all verbs:

63. Ralph's at the party, and Judy's at { it / *there } too.

With time prepositions, the pronominal form can never occur:

64. Jane worked until five o'clock and Bill worked until { it / *then } too.

In Hindi, the following sentence types show up:

64. She was going to the city by airplane and the boy was going there by car.

wo hawaaii jahaaz se us shahar kii or jaa rahii thii
she airplane by that city of direction go -ing was

aur wo laRkaa { wahãã / *us kii or } moTar se pahũc rahaa thaa.
and that boy { there / *to it } car by arriv -ing was

65. He arrived home and his guests arrived { there / *to it } too.

wo ghar pahũcaa aur us ke mehamaan bhii { wahĩĩ / *us kọ } { pahũce. / there arrived / *at it }
he house arrived and him of guests also

In Hindi, an alternation of two forms does not appear to be possible and

only the adverbial form occurs. The informants I consulted said the nominal PRO-form was clearly ungrammatical. However, in some cases, what appears to be a nominal form is present, but this is actually an elliptical one, the reduced surface reflex of a form such as wo jagah, that place. In these cases, wo is equivalent to that, not it.

The following sentences show the behavior of PRO-forms with postpositions:

66. That thief was leaving the bank and the police were entering it.

wo cor bãĩk se nikal rahaa thaa aur pulis { wahãã / us mẽ }
that thief bank from leav -ing was and police { there / it in }

ghus rahii thii.
enter -ing were

67. Some people are going into the theatre and some people are coming out of it.

kuch log sinemaa ghar kii or jaa rahe hãĩ aur
some people movie house of direction go -ing are and

kuch log { wahãã se / us se } nikal rahe hãĩ.
some people { there from / it from } leav -ing are

68. Ram is at the party and Sarita is there also.

raam paarTii mẽ hai aur saritaa bhii { wahãã / *us mẽ } hai.[2]
Ram party in is and Sarita also { there / *it in } is

As in English, with time expressions the pronominal form is not possible:

69. John worked until four o'clock and Bill worked until { then / *it } too.

jaan ne caar baje tak kaam kiyaa aur bil ne bhii
John four o'clock until work did and Bill also

{tab / *us} tak kaam kiyaa
{then / *it} until work did

In the case of postpositions, Hindi is like English in permitting both pronominal and adverbial PRO-forms, except in the case of time expressions, where only the adverbial PRO-form may occur.

These data seem to show that in regard to PRO-form objects, the argument is not as strong in Hindi as in English. In the speech of one of my informants, the pronominal form could not occur in the adverbial phrase or the verb phrase and thus represents the desired distribution within this theoretical framework. However, this was not the case in the speech of my other informants.

It could be claimed that the speech of my first informant represents a regularizing tendency: both verbs and adverbs can take only the adverbial PRO-form object. Although this is an appealing thought, I do not have enough historical or dialectal information or an analysis which is complete enough to do more than make the suggestion.

In any case, I do not feel this is a very strong argument because a postposition could be posited in deep structure in a synchronic analysis and then be deleted by a late rule. That this process is often involved is shown by the inflection of words which precede the spot where the posited postposition would be:

70. I am going to my house.

mãĩ apne ghar ∅ jaa rahaa hũũ.
I my house go -ing am

(6) A verbal origin has been posited for adjectives. If there is a rule which applies to adverbs, adjectives, and verbs only, we would have additional support for a verbal origin for all three. In considering sentences with predicate adjectives and adverbs, we would expect them to behave differently from predicate nominals. Examples of these types are:

71. She is attractive.

72. He is in New York.

73. He is a fool.

One process which differentiates between these two groups is Whiz-Deletion. This deletes the wh-word of relative clauses and the immediately following verb to be. Whiz-Deletion can occur in a restrictive relative clause which contains a verb, adjective, or adverb, but not when it contains a predicate nominal. Thus there are sentences of the form:

74. He met a girl (who is) beautiful ⟶
He met a beautiful girl.

Adjective Preposing, which applies to single lexical items, yields the grammatical form of the sentence after deletion.

75. He attended the meeting (which was) in Denver.

76. He likes the girl (who is) singing ⟶
He likes the singing girl.

There are no similar sentences which include an embedded predicate nominal:

77. He met the man who is the mayor ⟶/
*He met the man the mayor.

The following are examples of Hindi sentences:

With adjectives:

78. That boy met a girl who is beautiful.

wo laRkaa ek laRkii se milaa jo sundar hai. --→
that boy a girl with met who beautiful is

79. That boy met a beautiful girl.

wo laRkaa ek sundar laRkii se milaa.
that boy a beautiful girl with met

80. That city which is big is in India.

wo shahar jo baRa hai bhaarat mẽ hai. --→
that city which big is India in is

81. That big city is in India.

wo baRaa shahar bhaarat mẽ hai.
that big city India in is

With adverbials:

82. He went to that meeting which was in Delhi.

wo us sabhaa mẽ gayaa jo dillii mẽ thii. --→
he that meeting to went which Delhi in was

83. He went to the Delhi meeting.

wo dillii kii sabhaa mẽ gayaa.
he Delhi of meeting to went

wo dillii waalii sabhaa mẽ gayaa.
he Delhi one meeting in went

84. That book which is on the table is expensive.

jo kitaab mez par hai wo mahãgii hai. --→
which book table on is it expensive is

85. That book on the table is expensive.

mez par waalii kitaab mahãgii hai.
table on one book expensive is

mez par kii kitaab mahãgii hai.
table on of book expensive is

86. They went to the party which was on Saturday.

we us paarTii mẽ gaye jo shaniwaar ko thii. --→
they that party to went which Saturday on was

87. They went to the Saturday party.

we shaniwaar kii paarTii mẽ gaye.
they Saturday of party to went

With verb forms:

88. He likes that girl who is singing.

us ko wo laRkii pasand hai jo gaanaa gaa rahii hai. --→
him to that girl pleasing is who song sing -ing is

89. He likes that singing girl.

us ko wo gaanaa gaanewaalii laRkii pasand hai.
him to that song singing one girl pleasing is

In sentences with an animate subject, the types of reduction which can occur appear to be subject to a number of constraints. Consider the following data:

90. That boy who is in the room...

jo laRkaa us kamare mẽ hai wo... --→
which boy that room in is he

91. That boy in the room...

us kamare waalaa laRkaa...
that room one boy

92. My aunt who is in Delhi...

merii jo caacii dillii mẽ hai wo...--→
my which aunt Delhi in is she

93. My aunt in Delhi ...

merii dillii waalii caacii ...
my Delhi one aunt

94. That boy who is on the roof...

jo laRkaa chat par hai wo... --→
that boy roof on is he

95. That boy on the roof...

wo chat par waalaa laRkaa...
that roof on one boy

In this sentence, the postposition can not be deleted because it is not the unmarked form and is therefore not recoverable. The following sentence does not reduce:

96. That man on the table...

jo aadmii mez par hai wo... -/→
that man table on is he

97. That man on the table...

*mez par waalaa aadmii...
table on one man

It may be that the factor determining if a waalaa form can occur is whether the sentence is understood as elliptical. If it is, further reduction is not possible. Sentence 96 may be a shortened form of the structure underlying 98:

98. That man seated on the table...

wo mez par baiThaa huaa aadmii...
that table on in a state of sitting man

This would mean that with animate subjects, certain adverbial phrases can not occur as predicates, but only with verbs such as baiThnaa, to sit; khaRaa honaa, to stand; leTnaa, to lie. In any case, these examples are not critical to my discussion and I will not attempt to analyze them further.

The important point is that in the case of noun predicates, the sentence does not reduce:

99. That man who is my teacher is very smart.

wo sajjan jo mere adhyaapak hãĩ bahut tez hãĩ. -/→
that man who my teacher is very smart is

100. *That man-teacher is very smart.

*wo adhyaapak sajjan bahut tez hãĩ.
that teacher man very smart is

101. That jewel which is his treasure is beautiful.

wo gahnaa jo us kii nidhi hai sundar hai. -/→
that jewel which him of treasure is beautiful is

102. *His treasure-jewel is beautiful.

*us kii nidhi gahnaa bahut sundar hai.
him of treasure jewel very beautiful is

Although the structures involving relative reduction seem to be more complicated in Hindi than in English, involving at the very least an animate/inanimate dimension, there is still good evidence for treating the predicate nominal as a class apart since it does not undergo reduction.

This paper has been an attempt to motivate the analysis of adverbials in Hindi as higher verbs. I have relied heavily on Jonnie Geis's dissertation, in many cases using her examples and in all cases applying her arguments in English to Hindi. I have shown that, as in English, both transitive verbs and postpositions have objects and exhibit co-occurrence restrictions with these objects. These can be most parsimoniously stated on the postposition, and unless these surface-level forms are posited as verbs, some explanation must be given for the fact that the same features of nouns are relevant in both cases.

Both verbs and postpositions undergo Verb Phrase and Object Deletion. Although there are differences between the two languages, within each there is a consistency of rule application for the two

distinct surface classes.

In the case of pronominalization of the objects, I personally do not feel the argument is a strong one. With many adverbial objects of verbs, it could be argued that the postposition had been deleted by a late rule. This would explain the presence of the oblique case.

Adverbials undergo at least one rule in common with verbs and adjectives: Whiz-Deletion. Nouns do not conform to this process.

Finally this analysis gives an explanation for the appearance of postpositions with an SOV language such as Hindi.

IV. Arguments and Counter-Arguments

There are a number of objections which can be raised against a deverbal analysis of adverbs.

(1) Traditionally, postpositions have been derived from nominal forms. Although there has been great disagreement on the exact nature of these derivations, the basic assumption seems to be correct. This would seem, at first glance, to be strong counter-evidence to postpositions as underlying verbs. However, more extensive investigation shows this is not the case.

Paul Postal, in Aspects of Phonological Theory, has shown in his study of Mohawk and Oneida that synchronic rule ordering does not necessarily mirror diachronic order. This is because the optimum grammar is not always generated by adding a rule to the end (see Chpt. 13). This would argue that there is a distinction between the historical development of a language and the psychological reality reflected by the grammar. Granting that postpositions are historically derived from

nouns does not preclude the possibility that they are now perceived as verbs by the speakers of the language.

There is, however, no need to use either a phonological or meta-theoretical argument to support the deverbal analysis since there is ample evidence for it in the development of Hindi itself.

It is indeed true that most analyses of postpositions derive them from nouns, but they are usually derived from the locative case. This fact is sometimes overlooked. H. Bahri states (1959:350):

> We can now endorse with authority the opinion of Dr. Kellogg that most of the postpositions are originally nouns some of which have been truncated beyond recognition.

But Kellogg himself says (1955:380):

> Besides the...pronominal adverbs are many others of various derivations. Very many of these, indeed, are, in fact, old locative cases of nouns.

Many of the derivations he gives for the pronominal adverbs show that they too can be derived from locatives (see especially 373-380).

As might be expected, in several instances a locative case is posited as the origin of a modern postposition (Kellogg, 1955:129):

> loc. sing. madhya, middle --→ mẽ

Burrow, in his book The Sanskrit Language, says of adverbials (1965:280):

> A large number of the adverbials...are, in their ultimate analysis, case forms of nominal stems, e. g. the simple neuter stem which functions as nom. acc. sg. nt. (jaátu), endless locative (praatáa), instrumental (sáyutraá).

However, in some instances, the stem no longer has any function except in the adverbial form, while in others the stem can still be used as a substantive or adjective. Thus even in Sanskrit, from which Hindi derives many of these items, a verbal analysis can be supported.

The statement that postpositions are derived from nominals is a simplification which overlooks the critical matter of case.

By the time of Hindi, the case endings were almost completely gone and one form had to express the relationships formerly given by six cases. Sanskrit had evolved a system of using indeclinable adverbials to define more closely the relation expressed by a case affix (Burrows, 1965:283). At a later stage in the language, the newer adverbially-used case forms also served this purpose. This evolved into the modern system of declension with postpositions (Kellogg, 1955:119). This is a common pattern of change, well-documented in a number of instances, of an inflectional language changing to one in which separate morphemes and position express the grammatical relations. Since both inflections and postpositions must have co-existed to a rather great extent (note that presently there is still a trace of case in the oblique form in Hindi) and both performed the same function, it would be denying any possibility of psychological reality of the grammar if we argued that postpositions were deverbal and case endings were not.

We would be claiming that simply because the speaker chose a psotposition, i.e. a separate morpheme, rather than a case ending, he would be using completely different psychological processes. The not-unusual change from an inflectional to a positional language with the concurrent development of a pre/postpositional system would have to imply both a radical change in the psychological basis of the grammar and the simultaneous functioning of two different processes with the same ultimate communicative purpose in the mind of each speaker for an extended period of time. This is just the opposite of what one

would predict.

(2) It has been suggested that because the noun of agency, waalaa, occurs with postpositions, they should not be considered deverbal. I do not find this a serious objection. Although waalaa can occur with nouns and postpositions, it can also occur with adjectives and verbs:

| | | |
|---|---|---|
| paRhnewaale | those who study | (paRhnaa - to study) |
| rahanewaalaa | the one who lives | (rahanaa - to live) |
| gaanewaalaa | the one who sings | (gaanaa - to sing) |
| puraanaawaalaa | the old one | (puraanaa - old) |
| nayaawaalaa[3] | the new one | (nayaa - new) |

Therefore, by claiming that the same process applying to verbs applied to the postpositions, the same data could be used as evidence for the deverbal origin of postpositions. However, further investigation reveals that when the waalaa does join with a verb, it is only after nominalization of the verb has occurred. That it is a nominal form is shown by the face that the verb inflects in the same way a noun does:

| | | |
|---|---|---|
| aanewaalaa | the one who comes | (aanaa - to come) |
| kelewaalaa | banana seller | (kelaa - banana) |
| baccewaalaa | a person who has a child | (baccaa - child) |

More important, the distribution of waalaa is not over the entire group of postpositions. The following data show this:

| | | |
|---|---|---|
| baahar waalaa | the outside one | (baahar - outside) |
| andar waalaa | the inside one | (andar - inside) |
| paas waalaa | the near one | (paas - near) |
| *mẽ waalaa | *the one who is in | (mẽ - in) |

| | | | |
|---|---|---|---|
| | *par waalaa | *the one who is on | (par - on) |
| But: | mez par waalaa | the one on the table | (mez - table)<br>(par - on) |
| | kamaree (mẽ) waalaa | the one in the room | (kamaraa - room)<br>(mẽ - in) |

These facts indicate that waalaa does not attach to nouns and verbs at all but rather to Noun Phrases. A postposition and a verb, at the time in the derivation when this transformation applies, must be dominated by an NP node in the same way a noun must be.

Joining the waalaa to a true postposition (see below) would be analogous to joining it to a verb in the finite form:

* { paRhte waalaa / paRh rahe waalaa / paRh waalaa } *the studies one (paRhnaa - to study)

The distribution of this form gives strong support for treating postpositions and verbs as one class.

(3) Another problem is the construction and behavior of compound postpositions, a rather large group of items. I will use the following terms proposed by K. C. Bahl (1967:497) in discussing this class:

| | | | |
|---|---|---|---|
| aap | ke | paas | near you |
| you | | near | |
| noun | genitive marker | pseudonoun | |

The most serious objection to the verbal analysis is the fact that the genitive marker kaa which occurs in these structures inflects to agree with the gender of the following pseudonoun, which is traditionally considered a postposition:

| | |
|---|---|
| naukar kii jagah<br>servant of place | in place of the servant |
| ghar ke bhiitar<br>house inside | inside the house |

This class of words is discussed fairly extensively by Bahl (1967:497 ff.). He says:

> The common characteristics which distinguish these pseudo-nouns from nouns as well as adjectives are that they always imply oblique forms, do not occur with number and, with some exception, function as postpositions with the postpositions ke and/or se.

Note especially that the first element is either ke or se. Kellogg (1955:486) also states that these can be preceded by either the genitive or the ablative but no other group. The fact that this is a highly restricted group suggests that this form can be predicted, with the presence of one or the other being due to a semantic marking on the entire lexical unit.[4]

Although the inflected kaa could be attributed to the word directly following, the pseudonoun, it could also be attributed to the presence in deep structure of a postposition following the surface pseudonoun. This same process can be seen in the sentence:

103. I went to my friend's house.

mãĩ apne dost ke ghar ∅ gayaa.
I my friend of house went

Here, the postposition meaning to is deleted, but its presence in deep structure is indicated by the inflection of apnaa and kaa. There is no question of ghar, house, being a postposition. Native speakers of Hindi agree that a postposition is present at a deep level in sentences of this kind.

This is supported by Bahl's insight (1967:502):

> All pseudonouns and nouns occur as adverbs of place, direction, time or manner, and imply only one of the several simple postpositions. These implied postpositions are the primary postpositions of these pseudonouns and nouns.

The postposition can be deleted from one of these compound postpositions when the feature markings that the postposition contributes to the construction are redundant. He demonstrates this with two sentences (1967:500):

104. He has put the book here.

us ne pustak yahãã (par) rakhii thii.
he book here on put has

105. He has taken the book from here.

wo pustak yahãã se le gayaa thaa.
he book here from take (emphatic has past)

yahãã has the same markings as par, so the latter may be deleted. se, however, changes the meaning of the construction, so it must be present.

My feeling is that the term "pseudonoun" refers clearly to a surface phenomenon, and that in deep structure these should be treated as true nouns followed by true postpositions, a rather limited group.

This treatment is implied in Kellogg's work. He first makes the point that postpositions are used in substantive declensions to denote the cases of nouns and then attributes the presence of a postposition preceding an adverb to be due to the substantive character of the adverb (1955:386). He gives several examples of adverbs which require the genitive postposition: baahar, outside; saath, with, etc. Further on, he states (1955:487):

> Many words which, when following a noun in the genitive, must be rendered into English as prepositions, under other circumstances must be regarded as nouns, and often translated

accordingly.

The final argument involves the literal translation of some of these compound postpositions, given by Bahri (1959:349):

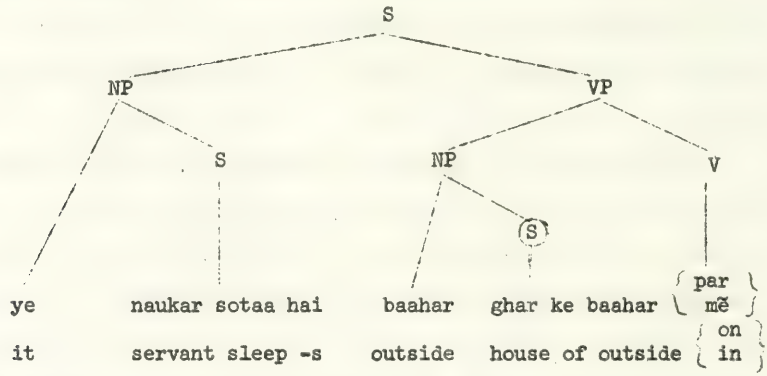
| | | | |
|---|---|---|---|
| sãg | company | aap ke sãg | along with you |
| saath | company | aap ke saath | with you |
| haath | hand | naukar ke haath | through the servant (by the hand of the servant) |
| kaaran | reason | aap ke kaaran | due to you |
| jagah | place | naukar kii jagah | in place of the servant |

In deep structure, for a sentence such as:

106. The servant sleeps outside the house.

naukar ghar ke baahar so -taa hai.
servant house of outside sleep -s

I would posit:




I do not want to try to formulate the genitive structure under the circled S node, but this would be more complex. If no genitive construction were present, the sentence would be:

107. The servant sleeps outside.

naukar baahar sotaa hai.
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In some of these compound postpositions, the surface manifestation as a noun is probably no longer possible and these would have to be marked as requiring a genitive construction.

There is a large group of words which supports the analysis of compound postpositions into the genitive marker, a noun and an underlying postposition: those compounds in which the postposition is present in surface structure. Examples include:

| | | | |
|---|---|---|---|
| kii bagal mẽ | along | bagal | side, border |
| kii tulnaa mẽ | beside | tulnaa | similarity, comparison |
| ke hisaab se | by (time) | hisaab | calculation |
| kii wajah se | because of | wajah | reason |
| kii dishaa mẽ | toward | dishaa | direction, point |
| ke { maarg / raaste } se | via | { maarg / raastaa } | { path / street } |
| ke baare mẽ | about | baaraa | matter, business |

The lack of inflection on the forms tulnaa and dishaa is due to the fact that they are feminine words of Sanskrit origin and characteristically do not inflect in the singular in the way masculine singular words ending in -aa do.

These cases seem analogous to those in which the true postposition is missing:

| | | | |
|---|---|---|---|
| ke pare | beyond | paraa | a line |
| ke piiche | after | piichaa | back |

| | | | |
|---|---|---|---|
| ke tale | under | talaa | bottom |
| kii or | at, towards | or | direction |

If in the face of this evidence we nevertheless choose to say the above pseudonouns are actually postpositions, we have to explain the following:

(1) The genitive marker agrees in gender with it. This would mean we would have to mark all postpositions for gender. Naturally this would include the true postpositions, a class which includes at least mẽ, se, par, tak, ko and probably a few others. Since there is no way to determine what the gender of these might be, the feature chosen would be completely arbitrary, which immediately throws serious doubt upon this position.

(2) The postpositions would also have to inflect for number, since many compound postpositions which are masculine (as indicated by ke) end in -e, the marker for both plural and oblique case. This could be avoided by claiming that there is no relationship between the compound postposition and the noun ending in -aa to which it is semantically related, but this is attributing far too much to coincidence and is completely ad hoc.

An elegant solution to this confusion is to posit a deep structure postposition which is deleted. With the addition of a deletion rule, others already required by the grammar for the generation of surface strings such as:

108. in John's house

jaan ke ghar mẽ
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will produce the correct compound postposition. This rule is required anyway to generate the string:

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This also explains the semantic link between the noun and the postpositional phrase.

## V. A Note on A. C. Sinha's Analysis of about - ke baare mẽ

If the analysis of postpositions as deep structure verbals is correct, it provides a possible way to resolve the problems created by A. C. Sinha's analysis of ke baare mẽ, presented in his dissertation, Predicate Complement Constructions in Hindi and English (1970). His analysis is ad hoc and is based on a large body of faulty data, which I will note in the body of this discussion.

ke baare mẽ is introduced in his chapter on embedded questions in Hindi (1970:106). In attempting to extend his analysis of complementizers, he says that only the clause complementizer, kii, and the gerundive, kaa -naa function in embedded questions. This immediately starts him off on the wrong foot since there are no sentences in Hindi of the form:

110. *mãĩ ne mãã se kis ke hone kaa puuchaa.
I mother from who of being of asked

111. *mãĩ ne mãã se us ke yahãã hone kaa puuchaa.
I mother from him of where being of asked

112. *mãĩ ne mãã se us ke kaise hone kaa puuchaa.
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Sinha considers these sentences and says they are ungrammatical because ho, to be, is introduced transformationally and could not appear before the gerundive element -naa. He then says the -naa is obligatorily deleted after an NP. This also generates an ungrammatical sentence. Apparently still trying to preserve his extension of the gerundive complementizer, he choses ke baare mẽ as the structure which is the surface reflex of the underlying complementizer kaa -naa. He sets up the ke as the inflected form of kaa; the -naa is deleted because it follows an NP; and baare mẽ is introduced transformationally. He gives no motivation for this other than the following (1970:112):

> The exact nature of the transformation (or transformations) that ultimately generates baare mẽ...is not at all clear although a dependency between this transformation (whatever its exact nature) and the gerundive complementizer is apparent.

The tentative nature of this statement in itself should cause any serious reader to question this analysis. However, there are many more fundamental reasons to do so.

First, he does not consider the gerundive equivalents of sentences such as:

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If the only reason the kaa -naa does not appear in the sentences with the copula is because that verb is introduced transformationally and

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This is a major problem for his analysis which he does not resolve.

Furthermore, he is forced to say that the gerundive equivalents of the following sentences with the clause complementizer have the same surface form (1970:107):

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The gerundive equivalent for all three of the above, in Sinha's analysis is:

120. I asked mother about him.

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He says (1970:107):

> Notice that the adverbial distinctions brought out by the sentences (by the question words kaisaa "how" and kahãã "where") are obliterated. However, the occurrence of this transformation is dependent upon the deep structure presence of an embedded question.

He could also have included kaun, who. In any case, this seems to be a clear instance of a transformation changing meanings in ways which are both major and unpredictable. I have found no Hindi speaker who agrees with these data. Furthermore, Sinha offers no explanation of how he gets rid of the question words beyond the quotations given above concerning the dependency of the baare mẽ transformation, the gerundive complementizer and embedded questions.

Setting the ke + baare mẽ up as related to the gerundive forces him to more extreme positions. Consider the following sentences (1970:109):

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Using this distinction, he correctly claims the following two

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Unfortunately, he claims the two above are not synonymous because 124 and the following are:

125. I want to know about him as to the time that he is going.

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He is pushed into this incorrect claim of synonymity because 124 has his ka -naa complementizer and ke baare mẽ. This means that ke baare mẽ in this sentence means about. Therefore, the sentence should be equivalent to 125 with the clause complementizer and about. He overlooks the significance of the fact that in 125 the ke baare mẽ follows samay, time and in 133 it follows wo (us), him. This is due to his failure to attribute real semantic content to the word baare (baaraa - affair, business, etc. See wishay.) In the beginning of his chapter, he clearly spells out this position when he says that baaraa, unlike wishay, can not appear alone meaning theme and he will therefore discuss only the former.

I will conclude this discussion of Sinha's position with one other example of the sentences he is forced to analyze as aynonymous since he

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Even at the most fundamental operational level, these are clearly not equivalent. The first will elicit a yes/no answer; the second, information. I do not wish to discuss this further.

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128. I saw that { business. / affair. }

*mãĩ ne wo baaraa dekhaa.
I that business saw

129. I thought about that { matter. / theme. }

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I that matter about thought

I am now going to suggest three possible tree structures. Although a complete formulation of the rules necessary to generate the surface structures is far beyond the scope of this paper, the trees are much closer to the semantic structures of the ke baare mẽ sentences than anything Sinha suggests, and they reflect the correct semantic

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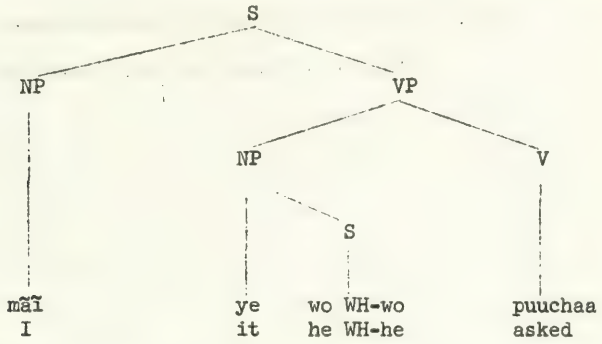


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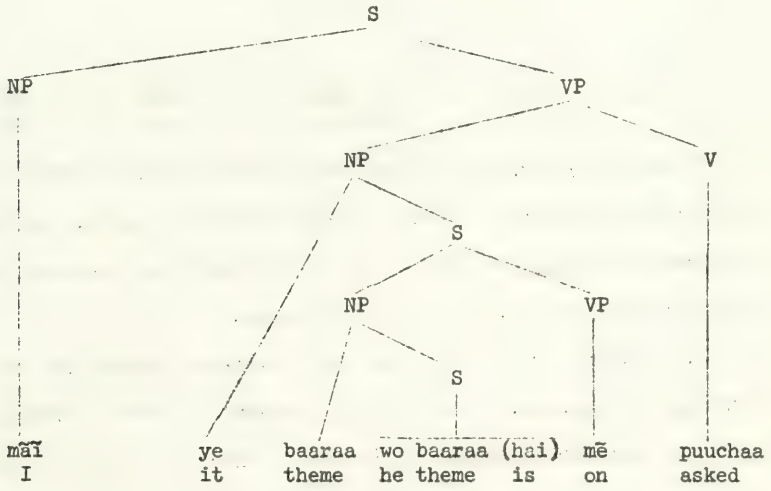

In this sentence, the lowest occurrence of baaraa is deleted under identity. The genitive transformation applies, yielding us ke. The it must be deleted in this sentence.

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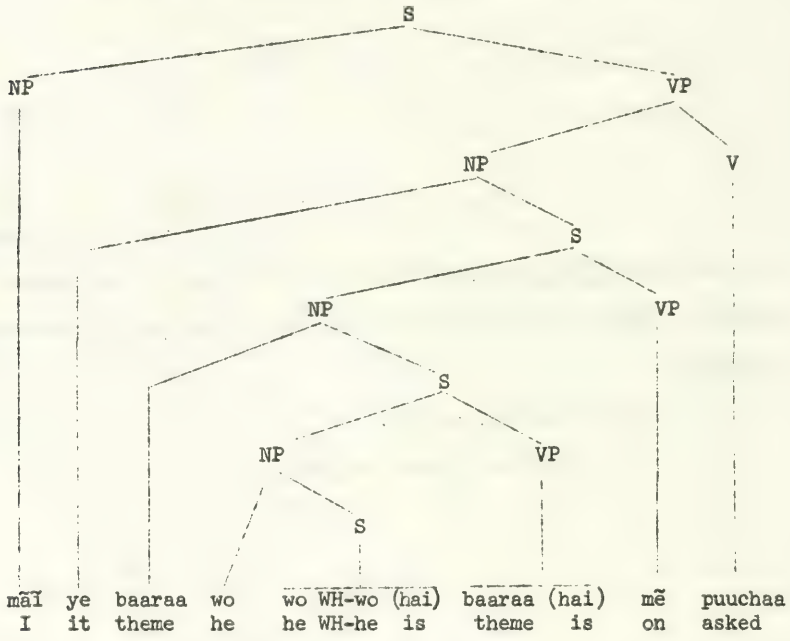


In this sentence, only the ki complementizer can apply to the most deeply embedded sentence because it is a question. Again, the two occurrences of baaraa reduce to one under identity and the genitive transformation applies. The it is deletable.

The problems created by having two different sources for the same structure are avoided, as well as the problems of deleting irrecoverable blocks of semantic material. Furthermore, these trees give a reasonable

explanation for the synonymity and distinction of sentence pairs, many of which are confused in Sinha's analysis.

One of the fundamental points of my analysis is that only the ki complementizer can occur with embedded questions. This prevents the generation of sentences such as 110, 111, 112 above.

It may be possible that a comprehensive study, which would cover a larger range of patterns in the language, would be able to motivate the genitive transformation without a specific rule. It has been suggested that the presence of two contiguous NPs automatically causes the occurrence of a postposition. It may be the case that the NP node dominating the adverbial subject is preserved during the Adverb Lowering transformation and triggers the genitive insertion, but this must wait for more extensive research.

NOTES

I wish to thank K. V. Subbarao, T. Bhatia and O. N. Koul for their invaluable help as my informants. Much gratitude is due to the above and to Dr. Yamuna Kachru for many hours of discussion which contributed greatly to the ideas expressed in this paper.

[1]In this sentence, the question word is obligatorily deleted. If it were present, the sentence would be multiply ambiguous. This seems to represent some type of culturally-conditioned rule: this particular sentence is not ambiguous because it is used only in one situation and the deleted items are therefore recoverable.

[2]This may be deviant either because party is a borrowed term or because, as in English, it represents an event rather than a place.

[3]Note that waalaa does not cause inflection of the adjective to the oblique case. Since this may be a slightly different process and it is not fundamental to my position, I will not discuss it at this time.

[4]In an unpublished paper, I have discussed the possibility of predicting the occurrence of the two lexical items of and with in device sentences in English on the basis of the presence or absence of negation in the semantic representation of the verb. Note the following: rob the woman of the jewels (the woman does not have the jewels); load the wagon with apples (the wagon has apples).

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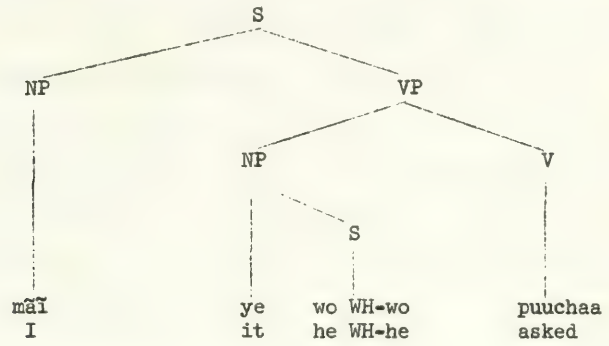


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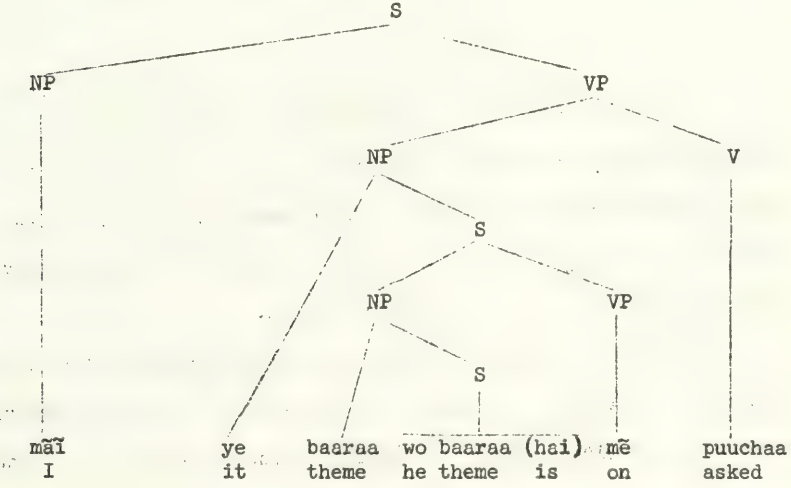

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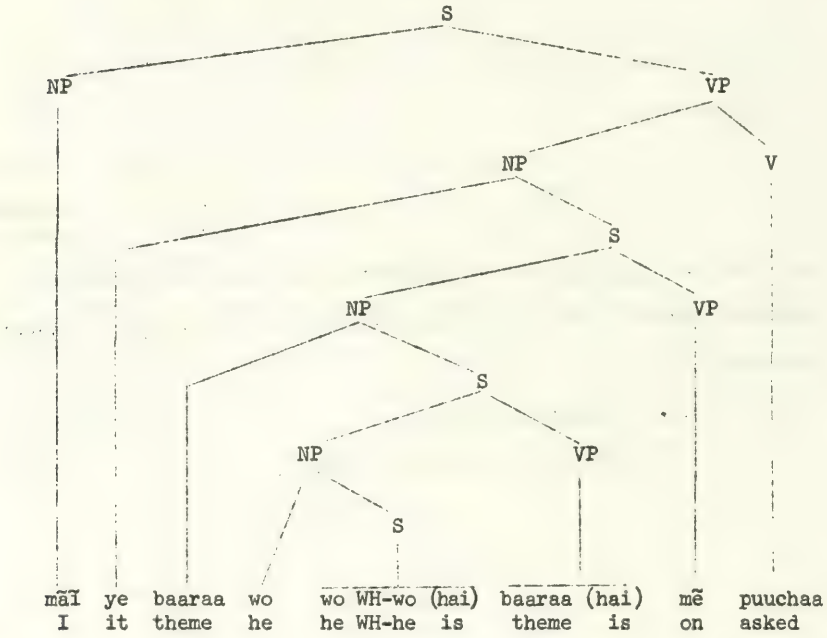
132. I asked about him as to who he was.

mãĩ ne us ke baare mẽ (ye) puuchaa ki wo kaun hai.




In this sentence, only the ki complementizer can apply to the most deeply embedded sentence because it is a question. Again, the two occurrences of baaraa reduce to one under identity and the genitive transformation applies. The it is deletable.

The problems created by having two different sources for the same structure are avoided, as well as the problems of deleting irrecoverable blocks of semantic material. Furthermore, these trees give a reasonable

explanation for the synonymity and distinction of sentence pairs, many of which are confused in Sinha's analysis.

One of the fundamental points of my analysis is that only the ki complementizer can occur with embedded questions. This prevents the generation of sentences such as 110, 111, 112 above.

It may be possible that a comprehensive study, which would cover a larger range of patterns in the language, would be able to motivate the genitive transformation without a specific rule. It has been suggested that the presence of two contiguous NPs automatically causes the occurrence of a postposition. It may be the case that the NP node dominating the adverbial subject is preserved during the Adverb Lowering transformation and triggers the genitive insertion, but this must wait for more extensive research.

NOTES

I wish to thank K. V. Subbarao, T. Bhatia and O. N. Koul for their invaluable help as my informants. Much gratitude is due to the above and to Dr. Yamuna Kachru for many hours of discussion which contributed greatly to the ideas expressed in this paper.

[1]In this sentence, the question word is obligatorily deleted. If it were present, the sentence would be multiply ambiguous. This seems to represent some type of culturally-conditioned rule: this particular sentence is not ambiguous because it is used only in one situation and the deleted items are therefore recoverable.

[2]This may be deviant either because party is a borrowed term or because, as in English, it represents an event rather than a place.

[3]Note that waalaa does not cause inflection of the adjective to the oblique case. Since this may be a slightly different process and it is not fundamental to my position, I will not discuss it at this time.

[4]In an unpublished paper, I have discussed the possibility of predicting the occurrence of the two lexical items of and with in device sentences in English on the basis of the presence or absence of negation in the semantic representation of the verb. Note the following: rob the woman of the jewels (the woman does not have the jewels); load the wagon with apples (the wagon has apples).

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# NOTES ON REFLEXIVIZATION IN HINDI

by

KARUMURI V. SUBBARAO

July, 1971

In this paper I shall essentially raise certain problems concerning some syntactic aspects of reflexivization in Hindi.[1] In particular, I will argue that it is not possible to solve the problems raised by the data from Hindi within the frame work of Transformational Grammar or Generative Semantics and thus, it necessitates some rivisions in the present theory. I have presented some partial solutions which I consider to be of theoratical interest. I shall discuss the following aspects: 1) Formulization of Reflexive rule in Hindi,2) The cyclic nature of Reflexivization in Hindi, 3) Ordering of Reflexive transformation with some other transformations in Hindi such as Subject Raising, Complementizer Change, Causativization etc. and interaction of rules that yield a type of sentences called ko sentences in Hindi with the rule of Reflexivization, 4) An examination of certain claims regarding linquistic universals connected with Reflexivization in the context of Hindi, and, 5) Specific problems related to Reflexive transformation in Hindi.

1 The personal pronouns in Hindi can be grouped in three persons and two numbers, just as in English.

| | Singular | Plural |
|---|---|---|
| I Person | mɛ̃ 'I' | hɐm 'we' |
| II Person | tuu 'you'(nonhonorific) | tum 'you' (familiar)<br>ap 'you' (honorific) |
| III Person | vɐh 'he, she, it'(dis.)<br>yɐh 'he, she, this(near) | ye 'they' (distant)<br>ye 'they' (near) |

The possessive forms of these are

| | Singular | Plural |
|---|---|---|
| I Person | mera 'my' | hɐmara 'our' |
| II Person | tera 'your' (non-honorific) | tumhara 'your'(familiar)<br>apka 'your' (honorific) |
| III Person | uska 'his, her, its'<br>iska 'his, her, its' | unka ' their'<br>inka ' their' |

All the possessive forms when reflexivized have the form ɐpna which can be translated into English as 'one's own.' All the possessive pronouns and the reflexive pronoun ɐpna are inflected for number and gender.

The reflexive pronoun in Hindi is ɐpne ap + post position which in English can be translated as 'one self'. This form in Hindi is "translation equivalent" for all the reflexive pronouns in English, namely, 'myself', 'ourselves', 'yourself', 'himself', 'herself', 'itself', and 'themselves'.

I shall now discuss the possessive reflexives in Hindi. Consider sentences (1) and (2).

(1) yəh merii kitab hɛ

this my book is

'This is my book'

(2) mɛ̃ ɐpnii kitabɛ̃ pərh rəha hũũ

I my books am reading.

'I'm reading my (refl.) books.'

In (1) there is only possessive pronoun and in (2) ɐpnii is a pos-

sessive reflexive pronoun. In Hindi, a sentence such as (3) is ungrammatical.

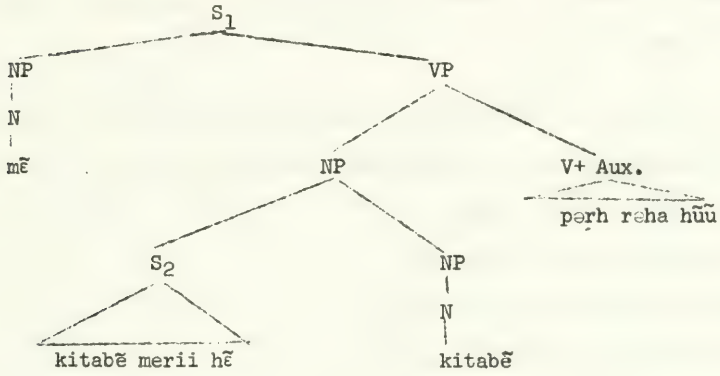
(3) *mɛ̃ merii kitabẽ pəṛh rəha hũũ.

'I'm reading my (poss.) books.'

The underlying structure of (2) is

(4) mɛ̃ ---kitabẽ merii hɛ̃ ---kitabẽ ---pərh rəha hũũ.

I books mine are am studying




First Relative Reduction rule applies and as a result we get

(5) mɛ̃ merii kitabẽ pərh rəha hũũ.

Reflexivization rule applies on (5) yielding (2). Possessive Reflexive transformation in Hindi can be formulized as in I.

I Possessive Reflexive transformation (Obligatory)

SD: $\begin{bmatrix} NP_1 \\ S \end{bmatrix}$---X---$NP_2$---[+Anaphoric]---[+poss. p.]---Y

SI 1 2 3 4 5

SC 1 2 ⟨+Refl.⟩ U 3-4 5

( p.p. stands for a post position and poss. stands for a possesive pronoun)

Conditions: i) 1= 3

ii) 1 commands 3

3 commands 1

NP
[+ Anaphoric] indicates that Pronominalization rule has already applied and therefore, the second occurrence of the coreferential NP is marked [ + Anaphoric]. Phonological rules would interpret $\langle$+ Refl$\rangle$ U 3-4 as əpna.

I shall now discuss Reflexive transformation which derives sentences with əpne ap + p.p.. Consider sentences (6) and (7).

(6) trilok usko bevkuuf manta hɛ

Trilok him stupid considers

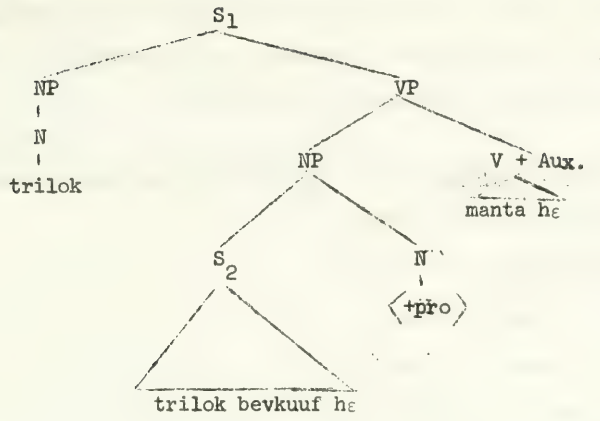
'Trilok considers him to be stupid'

(7) trilokəpne apko bevkuuf manta hɛ.

'Trilok considers himself to be stupid'

əpne apko in (7) is a reflexive pronoun and the underlying structure of sentence (7) is (8).

(8)




The following operations take place on (8) in order to yield (7): No significant operations take place on $S_2$ cycle. On $S_1$ cycle, Subject Raising transformation [2] takes place raising the subject of $S_2$ to direct object position of $S_1$. The second occurrence of trilok is pronominalized and then reflexivized to yield apne apko. Reflexive transformation does not take place in (6) because the indeces of reference of the subject and surface direct object are not identical. Reflexive transformation which operates on (8) is obligatory and it can be formulized as follows:

II Reflexive transformation (Obligatory)

SD: $\begin{bmatrix} NP_1 \\ S \end{bmatrix}$ --- Y --- $NP_2$ --- $\begin{bmatrix} \langle +\text{p. p.} \rangle \\ \langle +\text{poss.} \rangle \end{bmatrix}$ --- $\begin{bmatrix} Z \\ S \end{bmatrix}$

SI: 1 2 3 4 5

SC: 1 2 $\langle$+Refl.$\rangle$ U 3-4 5

Conditions: i) 1 = 3

ii) 1 & 3 command each other

Phonological rules would interpret ⟨+Refl.⟩ U 3-4 as əpne ap + post position. Some of the post positions that can follow $NP_2$ are se 'with', mẽ 'in', pər 'on' and ko 'to' etc.

The -ap in əpne ap + p.p. is sometimes optionally deleted. Consider sentences (9) and (10).

(9) vəh əpne ap mẽ khuš rəhta .
he in himself happy is
'He is happy with himself'

(10) vəh apne mẽ khuš rəhta hɛ.
'He is happy with himself'

The deletion of -ap can be formalized as follows:

III -ap Deletion (Optional)

SD: X --- əpne ap ---p.p. ---Z

SI: 1 2 3 4

SC: 1 əpne 3 4

This rule should be applied only when əpne ap is followed by a postposition. If this condition is disregarded and the above rule is applied to sentences such as (11), ungrammatical sentences such as (12) result.

(11) vəh əpne ap bahər gəya
he himself out went
'He himself went out'

(12) *vəh əpne bahər gəya

A close look at Possessive Reflexive rule and Reflexive rule would indicate that they are very similar in nature having identical structur-

al description. Therefore, these two rules should be collapsed into one rule. After collapsing, the revised Reflexive rule looks as follows:

IV Reflexive transformation (Obligatory) - (Revised)

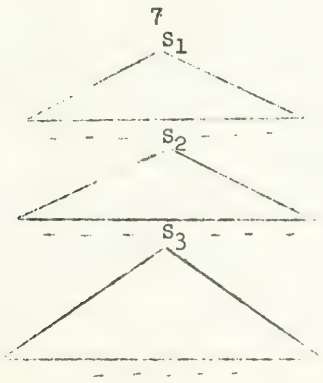
| | | | | | |
|---|---|---|---|---|---|
| SD: | $NP_1$ | --- Y --- | $NP_2$ | --- $\langle$+p. p. / +poss.$\rangle$ --- | Z |
| | $S_1$ | | [Anaphoric] | | S |
| SI: | 1 | 2 | 3 | 4 | 5 |
| SC: | 1 | 2 | $\langle$+Refl.$\rangle$ U 3-4 | | 5 |

Conditions: i) 1 = 3

ii) 1 & 3 command each other

The phonological rules would interpret $\langle$+Refl.$\rangle$ U 3 - $\langle$+ p.p. / +poss.$\rangle$ as <u>apna</u> and $\langle$+Refl.$\rangle$ U 3- $\langle$+ p.p. / -poss.$\rangle$ as <u>apne ap</u> + post position.

In this section, I shall discuss the cyclic nature of Reflexivization in Hindi. The notion of cyclic application of (some) transformations was proposed in Chomsky (1965) and discussed also in Ross(1967) and Lakoff(1966). Some of <u>ordered</u> transformational rules, according to this hypothesis, are applied in their abstract order to the lowest S in embedded sentences. In a structure like the following



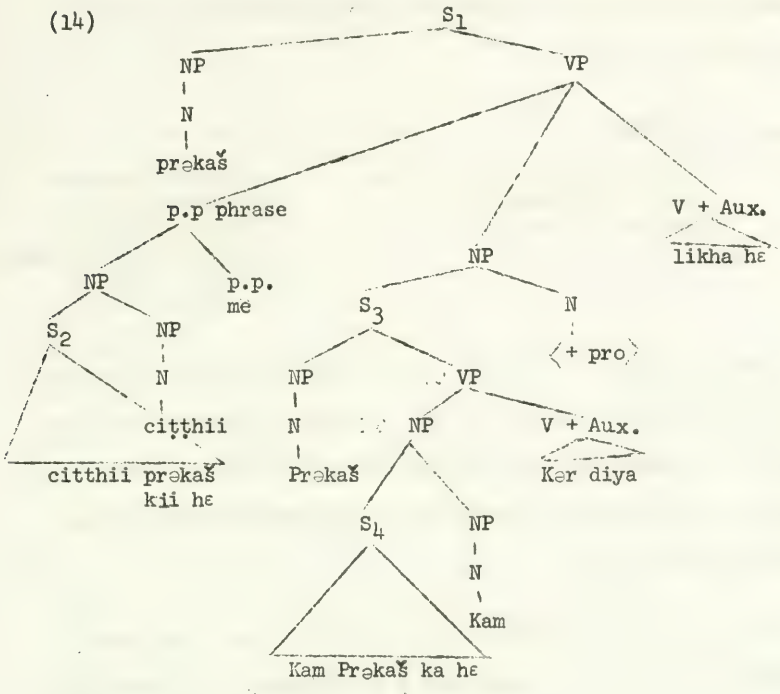
the transformations apply in a specific order to $S_3$. After applying the rules to $S_3$ we move to $S_2$ and apply once again and then to $S_1$ and apply once again. It should, however, be pointed out that a transformation that applied once on a given part of structure say sentence $S_3$, can not reapply to that tree in the same cycle. Also, there can be precyclic and post cyclic rules in a grammar of a laguage. (For further discussion see the references above).

To demonstrate that Reflexivization is in the cycle, let us consider a sentence such as (13).

(13) prəkaš ne əpnii ciṭṭhii mẽ likha hɛ ki usne
Prakash his(refl.) letter in wrote that he
əpna kam kər diya
his(refl) work did
'Prakash wrote in his letter that he finished his work.'

The underlying representation of (13) is (14).

(14)




Notice that on $S_4$ cycle no transformation of immediate relevance operates. On $S_3$ cycle, Relative Reduction transformation takes place yielding prəkas prəkaš ka kam kər diya. Pronominalization and Reflexivization operate changing prəkaš ka to əpna. No transformation applies to $S_2$. On $S_1$ cycle Relative Reduction transformation applies yielding prəkaš kii citthii mẽ. Pronominalization and Reflexivization apply yielding prəkaš əpnii citthii mẽ and vəh əpna kam kər diya. Complementizer Placement, Extraposition and ⟨+pro⟩ deletion apply in order to yield prəkaš əpnii citthii mẽ likha hɛ ki

vəh əpna kam kər diya. Finally ne Placement and other transformationsapply yielding (13). The order of transformations in the four cycles, therefore, are

| $S_4$ cycle | $S_3$ cycle | $S_2$ cycle | $S_1$ cycle |
|---|---|---|---|
| None | Relative Reduction<br>Pronominalization<br>Reflexivization | None | Relative Reduction<br>Pronominalization<br>Reflexivization<br>Complementizer Placement<br>Extraposition<br>(+ pro) Deletion |

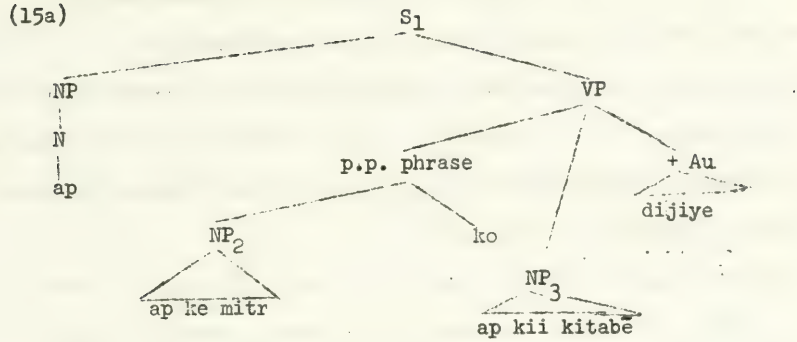
It can be noticed that in the derivation of sentence (13), Reflexivization operates twice, that is, once on $S_3$ cycle and once on $S_1$ cycle. The application of the same transformation more than once on different sentences in a derivation proves that Reflexive transformation is in the cycle.

Further, there is evidence to show that there is simultaneous application of Reflexive transformation to more than one constituent at the same time, if they all satisfy the condition for Reflexive rule.

(15) ( ap ) əpne mitro ko əpnii kitabẽ diijiye
you your(refl.) friends to your(refl.) books give
'Give your books to your friends.'

The underlying structure of (15) after Relative Reduction takes place is:

(15a)




In order to yield (15), Reflexive transformation has to apply simultaneously to $NP_2$ and $NP_3$ on $S_1$ cycle in (15a) changing both the occurrences of ap + possessive to apna.

Reflexivization in English is also considered to be a cyclic rule. But McCawley (1968) claims that Reflexive transformation in English is a prelexical transformation.[3] The argument provided in support of his claim is as follows: "There is a reason to believe that virtually all nominalizations arise through a single prelexical transformation". [italics mine] But McCawley does not provide any argument in support of his proposal. He then argues that Reflexive transformation should precede Nominalisation and therefore, Reflexive transformation should be a prelexical transformation. It should be pointed out that McCawley provides no syntactic or semantic argument to prove that Nominalization transformation is prelexical. Therefore, his proposal that Reflexivization is a prelexical transformation does not appear to be valid.[4]

So far no evidence has been found in Hindi suggesting that Reflexivization in Hindi is a prelexical transformation.

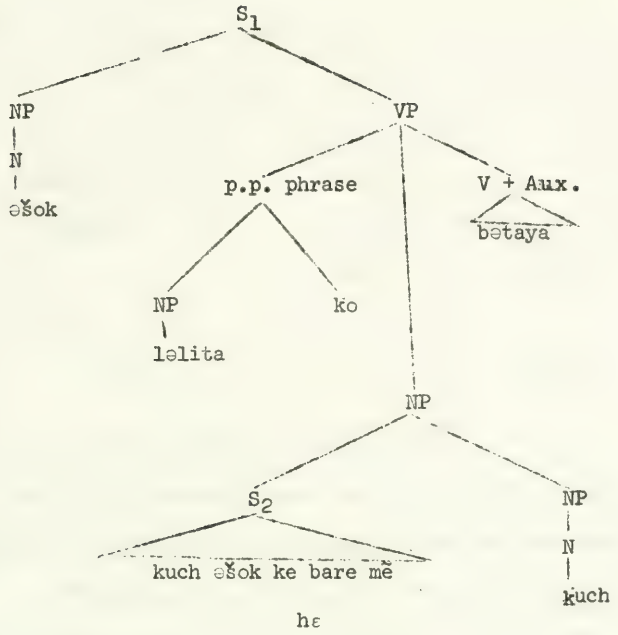
3. In the previous section, I showed that Reflexive transformation is a cyclic rule. In this section, I shall discuss the relative ordering of Reflexive transformation and some other transformations in Hindi. Consider sentences (16) and (17).

(16) əšok ne lalita ko əpne bare mẽ kuch bətaya.
Ashok Lalita to poss.(refl.) about something said
'Ashok said something about himself to Lalita'

(17) əšok ne ləlita se əpne liye cay bənane ko kəha
Ashok Lalita with for him (her) (poss. refl.) tea to make said
'Ashok asked Lalita to make some tea for him / herself'

It should be noted that only sentence (17) is ambigous and sentence (16) is not, that is <u>əpna</u> in (16) refers only to <u>əšok</u>, where as the possessive reflexive in (17) can refer either to <u>əšok</u> or to <u>ləlita</u>. The reason for this is that though sentences (16) and (17) look similar at the surface structure level, their underlying structures are different. The underlying structure (simplified) of (16) is (18).

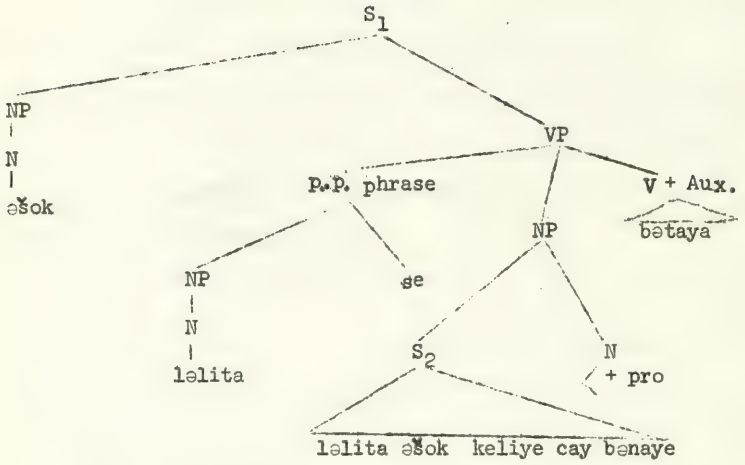
(18)




Relative reduction transformation applies on $S_1$ cycle yielding kuch əšok ke bare mẽ . Thus, the $S_2$ node is erased and the phrase kuch əšok ke bare mẽ and the subject NP of the sentence əšok are dominated by the same S node. Reflexive transformation applies at this stage of derivation yielding (16).

Sentence (17) has underlying representation (19) if əpna refers to əšok.

(19) [əšok lələita se [lələita əšok ke liye cay bənaye] kəha]
$S_1$ $S_2$ $S_2$ $S_1$

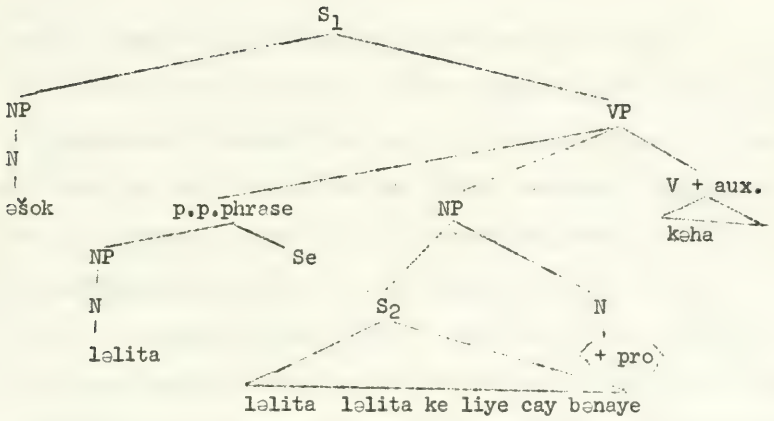



In (19), no transformation of significance operates on $S_2$ cyle. On $S_1$ cycle, Complementizer Change ka-na transformation applies yielding əšok ləlita se ləlita + ka əšok ke liye cay bənana + ko Kəha. Equi NP Deletion applies and deletes the second occurrence of identical NP ləlita. The ka following the second occurrence of ləlita is automatically deleted since the NP ləlita is deleted and $S_2$ is pruned. Reflexive transformation applies changing əšok ke liye to əpne liye. The order of transformations, therefore is

| $S_2$ cycle | $S_1$ cycle |
|---|---|
| None | Complementizer Change |
| | Equi NP Deletion |
| | Reflexivization |

If əpna refers to ləlita, (17) has underlying structure as in

(20) [ əšok ne ləlita se [ ləlita ləlita ke liye cay banaye] Kəha]
$S_1$ $S_2$ $S_2$ $S_1$




In (20), Reflexive transformation takes place on $S_2$ cycle yielding ləlita əpne liye cay bənaye. On $S_1$ cycle, Complementizer Change and EquiNP Deletion apply to yield (17). Equi NP Deletion transformation in this case deletes subject NP ləlita of $S_2$. The transformations that applied on (20) are as follows:

$S_1$ cycle

Reflexivization

$S_1$ cycle

Complementizer Change

Equi NP Deletion

The relative ordering of Causative and Reflexive transformations are discussed hereunder. Consider sentence (21).

(21) mɛ̃ ne bəcce ko əpne kəpre pəhnaye

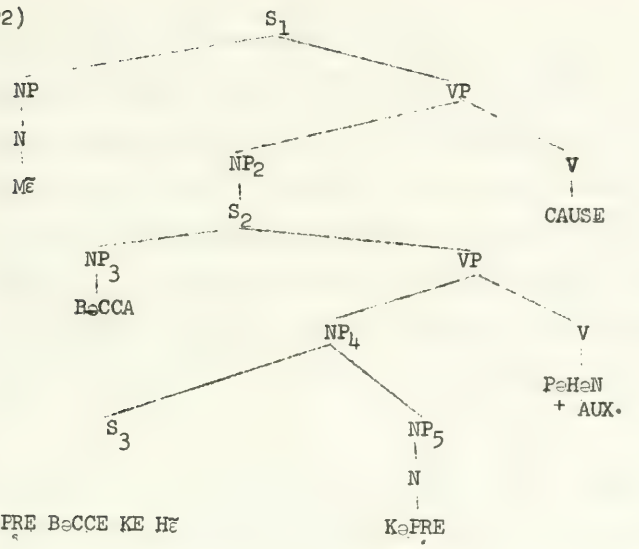
I to the boy my (refl.) clothes caused to wear.

'I put my clothes to the boy'

Notice that əpne in (21) refers only to mɛ̃ and not to bəcca. In Subbarao (1967), I argued that in order to block the derivation of sentences in which əpna refers to bəcca, the Causative transformation should precede Pronominalization and Reflexivization. But the ordering proposed is inadequate because if rules apply cyclically to trees, all the rules in the cycle should apply to each embedded sentence and to the matrix sentence as well. Thus, if Reflexivization is in the cycle, there is no way to prevent its application to each sentence of the tree diagram and thus we derive sentences with wrong semantic interpretation. Kleiman (1971) and Kachru (1971) propose that Causativization in Hindi, like in English, is a prelexical transformation(see note 4) i.e., Causative transformation applies before the semantic node VERB + CAUS. is replaced by a lexical item through lexical insertion transformations. If this proposal is accepted, according to Kleiman and Kachru, in sentences such as (21) əpna would uniquely refer to the instigator of the action, that is mɛ̃ in this sentence and not to bəcca. I'll present a step by step derivation of (21) in the frame work of the new proposal.

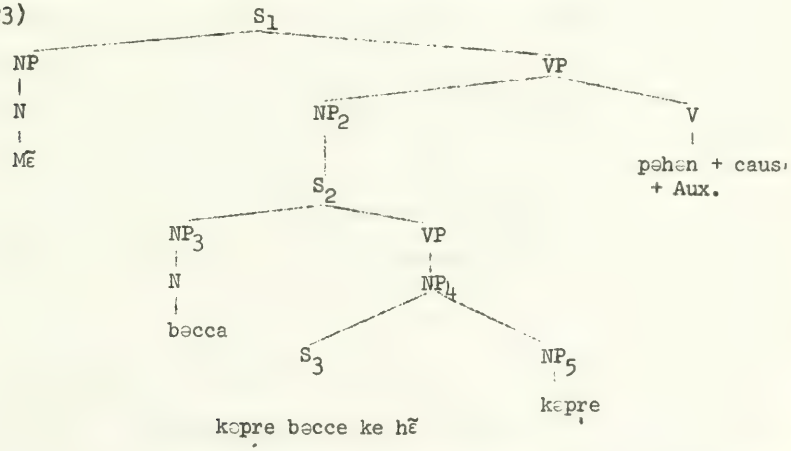
The underlying representation of (21) according to the new proposal would be as follows:[5]

(22)




Predicate Raising, which is a prelexical transformation according to Kleiman and Kachru applies on (22) yielding (23).

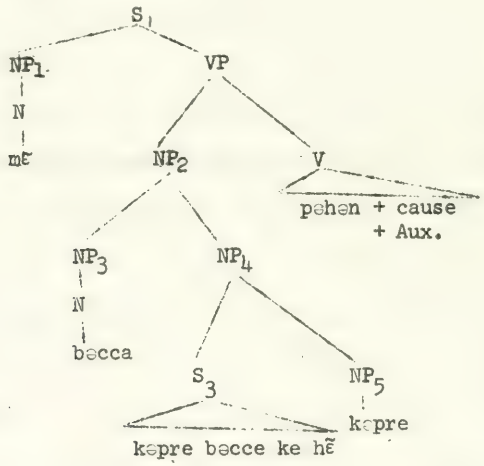
(23)




Notice that the conventions for tree pruning proposed by Ross et al. (1966) do not discuss under what conditions nodes such as VP are de-

leted. It seems that Kleiman and Kachru assume that once the innermost V in raised by the prelexical rule, the VP node that dominates it is erased, creating appropriate structure for the application of Ross's tree prunning convention. In order to arrive at the correct surface structure of sentence (21) these assumptions are crucial. They, however, leave some major problems as residues. Notice that if we delete the VP and subsequently the $S_2$ node, the remaining structure looks on follows:

(24)




Notice that $S_2$ node have disappeared before any of the cyclic rules could apply!

It could be argued that the VP and $S_2$ nodes are not deleted immediately after the prelexical rule of Causativization. In that case, cyclic rules are applied to (23) in the following manner:

$S_3$ - no rules apply

$S_2$ - $NP_4$ dominates $S_3$ and $NP_5$ which satisfy the condition for (i) Relativization and (ii) Relative Reduction. Therefore, these two rules apply in that order.

Now the resultant structure meets the structural description for reflexivization. The problem is, reflexivization has to be blocked to get the correct output. Therefore, it is suggested that the nodes VP, and subsequently $S_2$, are deleted at this stage. This, then blocks reflexivization.

There are two problems with this suggestion. If node deletion and tree pruning are conventions, they could not be ordered with respect to syntactic rules. Second, it is not the case that reflexivization has to be blocked at the stage mentioned above. If that were the case, the following sentence should have been ungrammatical.

(25) Šərmila ne bəcce ko əpne kəpre pəhnaye

But native speakers of Hindi assign two readings to the above sentence[6] one, əpna refers Šərmila, two əpna refers to bəcca. I must admit that I have come across only one such case, involving the verb pəhan and nouns which are interpreted as adult vs. child. Even so, one exception is enough to prove that more work is to be done on the interaction of reflexivization and causativization. Note that this does not invalidate the claim that causativization is a prelexical rule, it only points out that reflexivization may not provide the evidence to support the proposal that causativization is a prelexical rule.

I shall now discuss causative sentences which have an S embedded in the underlying structure. Consider sentences such as (26) and (27).

(26) prəkaš ne ag lega kər əpna jhənda jəla dala
Prakash fire having set his(refl.) flag burnt(Causative)
Prakash burnt his flag by setting fire to it.

(27) prəkas ke ag ləgane se uska jhənda jəl gəya.
Prakash fire setting due to his(poss.) flag burnt(inch.)
Because of Prakash's setting fire to it, his flag burnt.

Note that there is a possessive reflexive in (26) whereas there is a possessive pronoun in (27). The underlying subject of the conjunctive participle ləga kər is prəkaš and it is deleted due to indentity. Evidence that the subject (underlying) of conjunctive participle is deleted is obtained from sentences such as (28).

(28) həm logõ ne vəhã ja kər dekha
We people there having gone saw
'We went there and saw it'

The underlying structure of (28) is as in (29)

(29) [həm log [həm log vəhã gəye] dekha]
$S_1$ $S_2$ $S_2$ $S_1$

In Hindi in perfective a post position ne is attached to the logical subject of the sentence if the verb is +ne verb. jana is a -ne verb and dekhna +ne verb. Notice that dekhna is the verb of the matrix sentence and həm log, the logical

subject has the post position ne. If the subject of the embedded S is retained and not that of the matrix S, we should get sentences such as (30)

(30) həm log vəhã ja kər dekha.

But (30) is ungrammatical. Therefore, it is the subject of the embedded S that is deleted and not that of the matrix S.

In sentence (26), there is possessive reflexive pronoun əpna because by the time Reflexive rule applies, prəkaš and prəkaš ka are dominated by the same S and the embedded S is pruned. In (27), Reflexivization does not take place because there is no identity of NP's at the point in the derivation where Reflexive rule applies, that is, the subject of the matrix S is jhənda jhənda prəkaš ka hɛ and the subject of the embedded S is prəkaš. Therefore, in Hindi sentences such as (31) are ungrammatical.

(31) * prəkaš ke ag ləgane se əpna jhənda jəl gəya.

Another transformation that is crucial in the discussion of Reflexivization is Subject Raising. Under proper environment, the subject of the embedded S is raised to become the object of the matrix sentence. Subject Raising transformation operates in such sentences as (32).

(32) kuch log beiimanii ko gunah mante hɛ̃
some people cheating crime consider
'Some people consider cheating a crime'

The underlying representation of (33) is

(33) [kuch log [beiimanii gunah hɛ] N mante hɛ̃]
$S_1$ $S_2$ $S_2$ ⟨+pro⟩ $S_1$

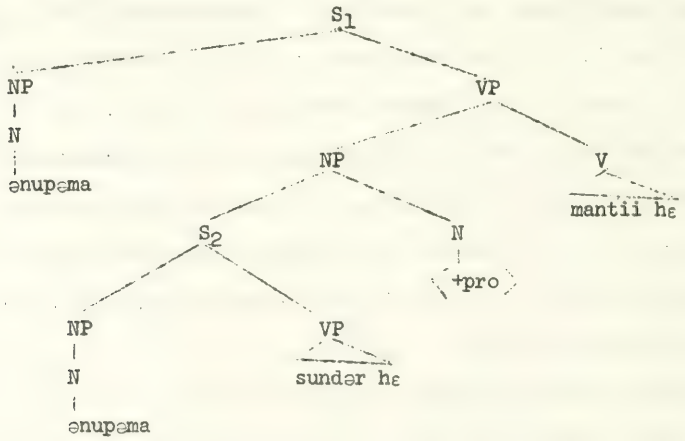
No transformation of relevance applies on $S_2$ cycle. Subject Raising applies on $S_1$ cycle moving beiimanii, the subject of the embedded S, to direct object position. hɛ of $S_2$ is deleted and pruning conditions erase $S_2$ node.

Reflexivization should follow Subject Raising in order to derive sentences such as (34).

(34) ənupəma əpne apko sundər mantii hɛ
Anupama herself pretty considers
'Anupama considers herself to be pretty'

The underlying representation of (34) is (35)

(35)




On $S_2$ cycle, Reflexivization does not apply because the identical occurrence of NP's do not command each other. On $S_1$ cycle

the subject of the embedded S is 'raised' to become the object of the matrix S. Then Reflexivization applies changing the second occurrence of ənupəma to apne ap. If Reflexivization precedes Subject Raising on $S_1$ cycle, we get ungrammatical sentences such as (36)

(36) * ənupəma$_i$ uskoi sundər mantii hɛ.

The ordering, therefore, is

Subject Raising
Reflexivization

(37) Reflexivization does not apply across coordinate conjuncts. Sentences (37) and (38) illustrate the point.

(37) həm ɔr həmare dost dillii ja rəhe hɛ̃.

We and our(poss.) friends Delhi are going.

'We and our friends are going to Delhi'

(38) həm əpne dostõ ke sath dillii ja rəhe hɛ̃

We our(refl.) friends with Delhi are going

'We are going to Delhi with our friends'.

The underlying structure of (37) is (39)

(39) [[həm dillii ja rəhe hɛ̃]$_{S_1}$ ɔr [həmare dost dillii ja rəhe hɛ̃]$_{S_2}$]$_{S_3}$

Reflexivization rule does not apply on $S_2$ or $S_1$. Reflexive transformation does not apply on $S_3$ cycle, either, as həm and həmare are not immediately dominated by the same S node. The underlying representation of (38) is as in (40).

(38) [həm hamare dost ke sath dillii ja rəhe hɛ̃]
$S_1$ $S_1$

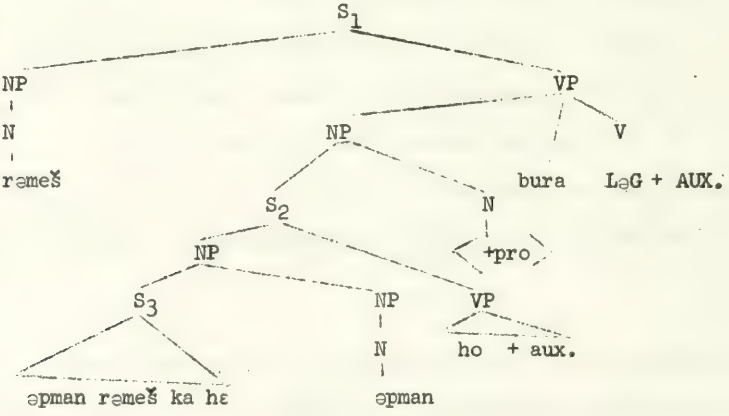
Reflexive transformation applies $S_1$ cycle and changes həmare to apne

In Hindi there is a class of sentences referred to as ko sentences.[7] In this type of construction, the logical subject of the sentence receives the post position ko and the logical object becomes the grammatical subject of the sentence. In sentence (41) rəmeš is the underlying subject of the sentence.

(41) rəmeš ko əpna əpman hona bura ləga
Ramesh his(poss. refl.) insult to be bad felt
'Ramesh felt bad about his being insulted'

The underlying representation of (41) is as in (42).

(42)




LəG in capital letters indicates that it is a semantic predicate and is not identical to the lexical item ləg in syntactic features. The following operations take place on (42) to yield (41).

Relative Reduction applies on $S_2$ cycle yielding rəmeš ka əpman ho + Aux. Complementizer Change takes place on $S_1$ cycle yielding

[rəmeš [rəmeš + ka əpman ho + na] [bura Ləg + Aux.] VP ] $S_1$
$S_1$ NP NP VP

At this stage of derivation Reflexivization applies changing rəmeš + ka to əpna. If the transformation which assigns ko to rəmeš applies before Reflexivization, the identity condition for Reflexive rule is lost and thus, it is not applicable. Therefore, Reflexivization should precede ko attachment.

It should be mentioned that the NP əpna əpman hona can be moved to the left of NP of $S_1$ as in (43) and such sentences should not be considered as instances of backward reflexivization.

(43) əpna əpman hona rəmeš ko bura ləga

4. In this section, I shall examine certain claims regarding linguistic universals connected with Reflexivization in the context of Hindi.

Ross (1967) says "I would hazard a guess that not only do rules of reflexivization universally not go down into relative clauses, they do not go down into reduced relative clauses." (page 153) [italics mine]. To say briefly, according to Ross, Reflexivization dows not take place in reduced relative clauses. But in Hindi, contrary to Ross's claim, Reflexivization rule applies in reduced relative clauses converting the second occurrence of identical NP + post position into a reflexive pronoun.

Consider sentence (44).

(44) əpne kəmre mẽ bɛthe hue logõ ko mẽ nəhĩĩ janta

my(poss. refl.) room in seated people I not know

'I do not know the people sitting in my room.'

The underlying representation (simplified) of sentence (44) is (45)

(45) [mẽ [ve log mere kəmre mẽ bɛthe hue hẽ] [un logõ ko] nəhĩĩ janta.]
$S_1$ $S_2$ NP $S_2$ NP $S_1$

First Relative Reduction applies on $S_1$ yielding mere kəmre mẽ bɛthe log which in the derived constituent structure is an NP and not an S. The condition for Reflexive transformation is satisfied and therefore, it applies converting the second identical occurrence of NP + ka to əpna, thus yielding (44). The order of the two transformations, therefore, is

Relative Reduction
Reflexivization

Thus, we see that Ross' guess about Reflexivization in Reduced Relatives is incorrect.

The second universal that is to be examined is movement of coreferential NP's. According to Postal's Cross over principle, (Postal, 1968), no NP mentioned in the structural index of a transformation may be reordered by that rule in such a way as to cross over a coreferential NP. Thus, sentence (46) cannot be passivized in English because it involves movement of coreferential

NP's

(46) John hit himself

(47) *Himself was hit by John

(48) *John was hit by himself

If Passive follows Reflexivization we get (47) and if it precedes Reflexivization, we get (48).

In Hindi, Passivization involves three stages: 1. Adding se 'by' to the agent and ya + ja to the verb; 2. optional agent movement and 3. optional agent deletion. Passive of a sentence such as (54) is as in (55) - (57).

(49) madhəvii ne vəh təsviir dekhii

Madhavi that picture saw

'Madhavi saw that picture.'

(50) madhəvii se vəh təsviir dekhii gəyii

'That picture was seen by Madhavi'

(51) vəh təsviir madhəvii se dekhii gəyii

(After agent movement)

(52) vəh təsviir dekhii gəyii

(After agent deletion in the appropriate context)

Reflexivization in Hindi has to precede agent deletion, otherwise the condition for Reflexive rule is not satisfied and thus ungrammatical sentences are generated.

In Hindi Passive rule operates on sentences with Possessive reflexives also. Passive of sentence (53) is (54).

(53) maltii ne əpna kam kiya
Malti her(poss. ref.) work did
'Malti did her work.'

(54) maltii se əpna kam kiya gəya

Passivization of sentences which have əpne ap + post position is also possible in Hindi. Passive of sentence (55) is (56).

(55) yəh burii khəbər suh kər
this bad news having heard
vəh əpne apko səmbhal nəhĩĩ səka
he himself could not control

'Having heard the bad news he could not control himself.'

(56) yəh burii khəbər sun kər usse
əpne apko səmbhala nəhĩĩ gəya

Notice that in (56) there is no agent movement or agent deletion. But, the agent in (56) can be crossed over the coreferential NP əpne apko as in sentence (57).

(57) yəh burii khəbər sun kər
əpne apko us se səmbhala nəhĩĩ gəya.

Though agent movement in Hindi optional, sentences such as (57) provide evidence against Postal's claim about coreferential NP's as a universal.

5. In this section, I shall discuss some sentences which pose problems to the analysis persented above.

The reflexive rule, which is treated as obligatory in Hindi, appears to be optional in sentences with multiple embeddings. Consider sentences such as

(58) mɛ̃ ne kuch logõ ko mere$_1$ kəmre mẽ bɛth kar mere$_2$bare mẽ
I some people my room in sitting about me
batẽ kərte hue suna.
talking heard

Some native speakers felt that əpne also can be used in place of mere$_1$ and mere$_2$ whereas some others felt that mere$_1$ is obligatorily replaced by əpne and mere$_2$ optionally. For some other speakers mere$_1$ cannot be replaced by əpne but mere$_2$ can be. At present it is not known how to account for the variation in the use of mera and əpna. But, for native speakers of category two above, the 'distance' of the possessive pronoun from the subject of the sentence appears to be a factor in deciding whether Reflexive transformation is obligatory or not. Further study of this phenomenon is needed.

Another place where Reflexivization is optional is in sentences such as (59)

(59) prəsad ne ləlita se {uske liye / əpne liye} cay banane ko kəha
Prasad Lalita {for him(her) / for himself(herself)} tea to make said

Notice that uske liye in (59) may either refer to prəsad or to ləlita or to some other person, where as əpne liye refers either

to prəsad or to ləlita but not to any other person. If Reflexivization in Hindi is obligatory, one would expect uske liye to refer to some third person but not to prəsad or to ləlita. Notice that the sentence

ləlita ləlita ke liye cay bənaye

is embedded in another sentence

prəsad ne kəha

In an unembedded sentence such as

(60) ləlita ləlita keliye cay bənaye

Pronominalization and Reflexivization have to obligatorily take place. If pronominal form uske liye occurs, then it can not refer to ləlita, it refers only to some third person. It is worthwhile to repeat that uske liye in (59) may refer to ləlita. In order to account for the optionality of the Reflexive rule, we may propose that Reflexivization in Hindi is optional when there is ambiguity in reference i.e., when a pronoun refers to more than one NP. This proposal accounts for the obligatoriness of the Reflexive rule in (60) and its optionality in (59). Either transformational grammar or generative semantics do not provide any mechanism to formulize such conditions.

Still there are problems related to reference in sentences with possessive reflexive. Consider sentences (61) and (62).

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (61) | kusum | ne | mohnii | ko | əpne$_j$ | kəmre | mẽ | əpne$_j$ |
| | kusum | | mohnii | | her(refl.) | room | in | |
| | kurta | siite | hue | dekha | | | | |
| | shirt | sowing | | saw | | | | |
| | 'Kusum | saw | Mohnii | sowing | her | shirt | in | her room' |

(62) kusum mohnii ko əpne$_{i,j}$ kəmre mẽ
Kusum Mohnii her(refl.) room in
əpna$_{i,j}$ kurta siite hue dekh kər naraz ho gəyii
her shirt sowing having seen angry became
'Kusum became angry having seen Mohnii sowing her shirt
in her room.'

(62) is ambiguous, the two occurences of əpna in one reading, refer to kusum, in another to mohnii. One would normally expect (61) also to be ambiguous. But, that is not the case. I'm not sure how to account for these facts. Possibly, the factors that determine the application of Reflexive rule relate to the features of verbs such as kəhna 'to say', dekhna 'to see' etc., or to those and the properties of partticipial and V - kər adverbials.

But, the new proposal does not work the way it should. According to it Reflexive rule is optional if there is ambiguity in reference. But there are sentences in Hindi, where Reflexivization is optional though there is no ambiguity in reference. Given the underlying structure of sentence (63), one would expect the Reflexive rule to operate obligatorily but it does not.

(63) sureš ko {uska / əpna} yõ... əpmanit hona burą łəgą
Suresh his this manner being insulted bad felt
'Suresh felt bad of his being insulted this way'

If we maintain that x ka əpmanit hona is not an NP but

an S, Reflexivization should not at all take place but it does. If we modify the Reflexive rule in such a way that it operates on noun phrases which are not clause mates, we derive many ungrammatical sentences. Among others, sentences such as (63).

(63) * hæm or æpne dost muuvii dekhne gæye
We and our(refl.) friends went to see the movie

Since my new proposal accounts for only a subset of sentences, I am not sure of the factors that determine the obligatory or optional operation of the Reflexive rule in Hindi.

6. In this paper, I think I have raised more questions than I have answered. A detailed study of pruning conditions and the interaction of Reflexivization with other syntactic processes such as pronominalization causativization, adverbiolization, participial formation may provide answers to some of the problems that I raised in this paper. The operation of node deletion and tree pruning conditions after the application of prelexical rules should be studied in greater detail.

Though I could not provide solutions to many problems concerning Reflexives in Hindi, I hope that this study will provide a fruitful direction in which further research can be carried on.

## NOTES

1. I'm thankful to the Center for Asian Studies for the grant in Summer 1969 which enabled me to do this research. I'm deeply indebted to my advisor Dr. Yamuna Kachru for her valuable suggestions and comments during the preparation of this paper. I'm grateful to Pulavarti Satyanarayana for the discussions that went into the planning of the paper and to Dr. Braj B. Kachru for his encouragement.

2. This term is due to Kiparsky and Kiparsky. For further details see Kiparsky and Kiparsky (1968).

3. According to the lexicalist hypothesis, all transformations apply in a derivation only after lexical insertion takes place, that is, all transformations operate on lexical material. The transformationalists, on the contrary, claim that some transformations such as causativization are prelexical implying that some transformations may also apply before lexical insertion. Thus, a prelexical transformation applies to trees which terminate in semantic matter rather than lexical matter.

4. McCawley(1968) also claims that causativization is a prelexical transformation. Though intuitively his claim appears to be correct, not enough syntactic or semantic evidence is provided in his paper in support of his claim. For further discussion, see among others, Chomsky (1970), Fodor (1970) and Morgan (1969).

5. I use capital letters to indicate that the items are Semantic predicates and not lexical items.

6. Dr. Yamuna Kachru pointed out to me the ambiguity of such sentences.

7. See Kachru (1970).

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# E R R A T A

Please note the following corrections; this list is not exhaustive.

| Page no. | Line | Incorrect | Correct |
|---|---|---|---|
| 2 | 22 | s w | saw |
| 3 | 3 | masculin | masculine |
| | 5 | distinceive | distintive |
| 4 | 2 | mã | mãi |
| 5 | 27 | fact | facts |
| 7 | 26 | rhe | the |
| 8 | 3 | * He ... | He ... |
| 9 | 14 | shy timid | timid |
| 11 | 26 | arguements | arguement |
| 13 | 5 | menaing | meaning |
| 20 | 2 | differenc | different |
| | last | main clause | object NP |
| 21 | 2 | rain clause | P Phrase |
| | 16 | bər | bərī |
| 27 | 16 | limitations | limitation |
| 28 | 1 | ralizing | realizing |
| 31 | 22 | uiiquely | uniquely |
| 37 | 21 | 'wo' | 'who' |
| | | 'wi' | 'wife' |
| 45 | 17 | 'are sitting' | 'were sitting' |
| 51 | 15 | of | on |
| 52 | 8 | pages | page |

ERRATA (Continued)

| Page no. | Line | Incorrect | Correct |
|---|---|---|---|
| 105 | 23 | m˜ | mɛ̃ |
| 106 | 10 | Posembaum | Posenbaum |
| 116 | 14 | ...the boy...sleep. | ...the boy sleep, crying. |
| 117 | 25-26 | 'The servant...run' | '...dog run, chewing a bone' |
| 121 | 1st diagram | NP<br>jo bhai | NP<br>bhai<br>bhai |
| | 2nd diagram | NP | NP<br>bhai |
| 122 | 23 | (30a) | (30b) |
| 130 | 2nd diagram | S<br>NP<br>bəcca | S<br>NP<br>mã |
| 180 | 8 | formulization | formalization |
| | 23 | ve | ve |
| 182 | 11 | formulized | formalized |
| 184 | 9 | " | " |
| 185 | 6 | rəhta | rəhta hɛ |
| 187 | 2 | apply | apply the rules |
| | 3 | " | " " " |
| 193 | Diagram | bətaya | kəha |
| 194 | last | 'I...boy' | 'I dressed the boy in my clothes' |
| 196 | 2nd diagram | Mɛ̃ | mɛ̃ |

ERRATA (Continued)

| Page no. | Line | Incorrect | Correct |
|---|---|---|---|
| 197 | 9 | have | has |
| 198 | 17 | refers | refers to |
| 209 | 20 | formulize | formalize |
| 211 | 14 | I | I have |

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# Emotive Verbs in English and Japanese[1]

by Noriko Akatsuka

The Ohio State University

## 0. Preface

This paper treats a class of English verbs of emotion such as pleased, happy, amused, sad, worried, etc. and their Japanese counterparts such as yorokobu, tanosimu, kanasimu, nayamu, etc. Henceforth, they will be called emotive verbs. In Section 1, I will present evidence that both English and Japanese emotive verbs are not inherently transitive verbs and their surface objects have been derived by a transformation. In Section 2 and 3, I will discuss two existing analyses of emotive verbs, both of which consider emotive verbs to be inherently transitive. I will show why these analyses are wrong.

## 1. Emotive Verbs as Inherently Intransitive.

In what follows, I will discuss English sentences and their Japanese equivalents together. A number such as '(1)' is to be interpreted as referring to two sentences, one English and one Japanese.

Compare sentences (1) with sentences (2)

(1) Alice was {pleased / happy} that [she was popular with boys].
S

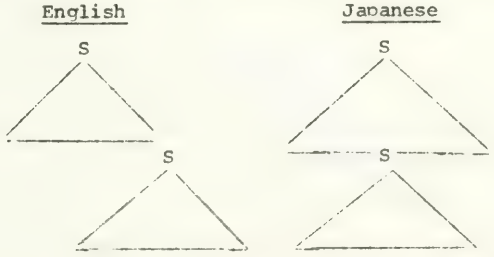
Arisu wa [zibun ga otokonoko ni moteru] koto o yorokonda.
she boys with popular S that pleased, happy

(2) Alice was convinced that [she was popular with boys].
certain S

Arisu wa [zibun ga otokonoko ni moteru] koto o kakusinsita.
S convinced, certain

Sentences (1) and (2) have the same surface structures such as (3).

(3)



However, I would like to show that sentences like (1) and sentences like (2) are quite different in their derivational history and that the former have derived sentential objects, whereas the latter have deep structure sentential objects. In the following, I will present five arguments to justify my claim that emotive verbs are not transitive verbs on the deeper level.

First, notice that only sentences like (2) have corresponding causative forms. Compare (4) and (5).

(4) *Bill {pleased Alice / made Alice happy} that [she was popular with boys]$_S$.

*Biru wa Arisu ni [zibun ga otokonoko ni moteru]$_S$ koto o yorokob-sase-ta.
pleased make Pst

(5) Bill {convinced Alice / made Alice certain} that [she was popular with boys]$_S$.

Biru wa Arisu ni [zibun ga otokonoko ni moteru]$_S$ koto o kakusins-sase-ta.
convinced make Pst

Note, furthermore, that causatives like (4) are perfectly grammatical without their sentential objects, as shown by (6).

(6) Bill has made Alice happy Ø.

Biru wa Arisu o Ø yorokob-sase-ta.

This is not the case with causatives with transitive verbs such as (5). If they lose their sentential objects, they become ungrammatical. Observe:

(7) *Bill has convinced Alice Ø.

*Biru wa Arisu o Ø kakusins-sase-ta.

Second, note that stative transitive verbs do not occur in Agentive causative constructions, as shown below.[2]

(8) *Bill made Alice resemble her mother.

*Biru wa Arisu o hahaoya ni ni-sase-ta.

(9) *Bill made Alice see a ghost.

*Biru wa Arisu ni yuurei o mie-sase-ta.
ghost see make Pst

Therefore, one might argue that emotive verbs are stative transitive verbs. However, the deletion of the objects does not change the grammaticality of (8) and (9). They remain ungrammatical:

(10) *Bill made Alice resemble Ø.

*Biru wa Arisu o/ni Ø ni-sase-ta.

(11) *Bill made Alice see Ø.

*Biru wa Arisu o/ni Ø mie-sase-ta.

Thus, it is quite obvious that emotive verbs behave differently from stative transitive verbs, too.

Third, every sentence with an emotive verb is paraphrased by a sentence with a because or node clause as in (12).

(12) a. Alice was {pleased / happy} that [she was popular with boys]$_S$.

Arisu wa [zibun ga otokonoko ni moteru]$_S$ koto o yorokonda.

b. Because [she was popular with boys]$_S$, Alice was {pleased / happy}.

[Zibun ga otokonoko ni moteru]$_S$ node, Arisu wa yorokonda.
because

Note that the surface complement of pleased, happy and yorokobu and the clause introduced by because or node in (12) are identical. This is very significant, for this kind of meaning relation does not hold in the case of transitive verbs. For example (13.a) is not paraphrased by (13.b).

(13) a. Alice was {convinced / certain} that [she was popular with boys]$_S$.

Arisu wa [zibun ga otokonoko ni moteru] koto o kakusinsita.

b. *Because [she was popular with boys]$_S$, Alice was {convinced / certain}.

*[Zibun ga otokonoko ni moteru]$_S$ node, Arisu wa kakusinsita.

Fourth, consider (12.a) and (12.b) again. Notice that in (12.b) emotive verbs lack their objects. If it is true that they are inherently transitive, then why do pleased, happy and yorokobu have no objects in (12.b)? There must be a convincing account of what has happened to their objects. The crucial point here is that the cause of emotion is statable either in the form of the direct object of emotive verbs or in the form of a because clause as in (12.a) and (12.b).

Fifth, note that sentences with emotive verbs such as (14.a) are paraphrased by causative constructions whose subjects are identical to the surface objects of the emotive verbs. Consider:

(14) a. Alice was {pleased / happy} that [she was popular with boys]$_S$.

Arisu wa [zibun ga otokonoko ni moteru]$_S$ koto o yorokonda.

b. That [she was popular with boys]$_S$ {pleased Alice / made Alice happy}.

[Zibun ga otokonoko ni moteru]$_S$ koto ga Arisu o yorokob-sase-ta.

This is not the case with transitive verbs. For example, (15.a) is not paraphrased by (15.b).

(15) a. Alice was {convinced / certain} that [she was popular with boys]$_S$.

Arisu wa [zibun ga otokonoko ni moteru]$_S$ koto o kakusinsita.

b. *That [she was popular with boys] {convinced Alice / made Alice certain}.

*[Zibun ga otokonoko ni moteru] koto ga Arisu o kakusins-sase-ta.

So far I have shown that emotive verbs behave quite differently from ordinary transitive verbs in a number of significant ways. I would like to claim, therefore, that emotive verbs are derived transitive verbs, i.e. that their sentential objects do not originate as their objects on the deeper level. Naturally a question arises: where have their objects come from? Consider the sentences in (16). In spite of the differences in their surface structures, they are essential paraphrases of each other.

(16) a. Alice was {pleased / happy} that [she was popular with boys]$_S$.

Arisu wa [zibun ga otokonoko ni moteru]$_S$ koto o yorokonda.

b. That [she was popular with boys] {pleased Alice. / made Alice happy}.

[Zibun ga otokonoko ni moteru] koto ga Arisu o yorokob-sase-ta.

c. Because [she was popular with boys]$_S$, Alice was {pleased. / happy}

[Zibun ga otokonoko ni moteru]$_S$ node, Arisu wa yorokonda.

I have already pointed out that the surface complement of emotive verbs in (16.a), she was popular with boys or zibun ga otokonoko ni moteru, is the surface subject of (16.b). Moreover, it is identical with the clause introduced by because or followed by node in (16.c). Also, notice that it is in complementary distribution in (16.a) and (16.c). (17) is ungrammatical.

(17) *Because [she was popular with boys]$_S$, Alice was {pleased, / happy}

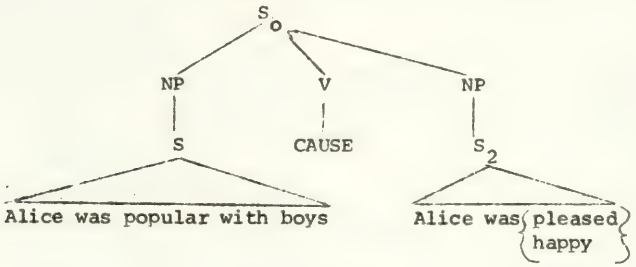
that [she was popular with boys]$_S$.

*[Zibun ga otokonoko ni moteru]$_S$ node, Arisu wa [zibun ga otokonoko ni moteru]$_S$ koto o yorokonda.

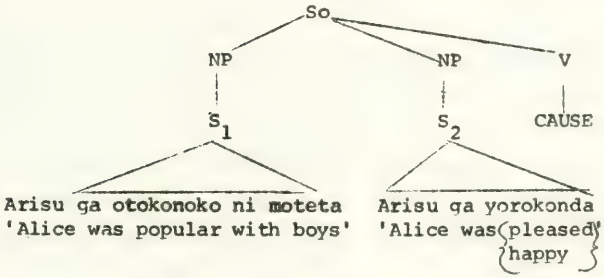
I maintain that adequate grammars of both English and Japanese will have to explain the above facts on a principled bases. I would like to propose that (16.a), (16.b) and (16.c) share the same deep structure which is a causative construction. It will be roughly as in a tree like (18).

(18)

English

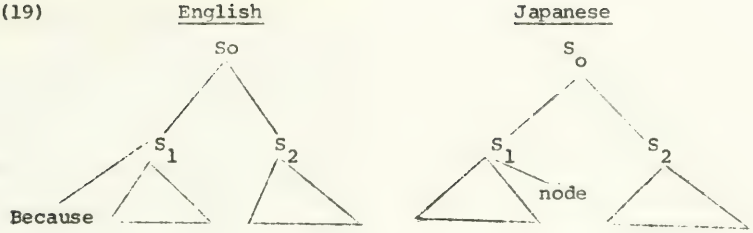



Japanese




I maintain that an abstract verb CAUSE relates two states of affairs in such a way that because of the first state of affairs the second state of affairs comes about. If Verb-Raising takes place in (18), then we get (16.b). I propose that both English and Japanese have two transformations; Causal Object Formation and Because Formation. Causal Object Formation takes the first argument of an abstract verb CAUSE and makes it a derived object of emotive verbs as in (16.a). Because Formation changes the tree configurations of (18) into something like the following:

(19)




This operation yields (16.c). In passing, I would like to point out that every causative sentence is paraphrased by a because sentence. Take the example of (20).

(20) a. Alice broke her mother's heart by marrying a Japanese.

Arisu wa, Nihon-jin to kekkonsite, hahaoya o hitan ni
Japanese with marrying mother broken-hearted

kure-sase-ta.
make Pst

b. Because Alice married a Japanese, her mother became heart-broken.

Arisu ga Nihon-jin to kekkonsita node, hahaoya ga hitan ni kureta.

Thus, Because Formation is not confined to Emotive causative constructions.

Notice that our analyses can explain why sentential objects are in complementary distribution with because-clauses in (16.a) and (16.c): the sentential object and the because-clause come from the same origin. Also, our analyses can explain why pleased, happy and yorokobu in (16.b) and (16.c) do not have objects.

A grammar has explanatory power only if it makes correct predictions of many relations between syntactic facts and meaning which otherwise would remain mysterious. So long as we treat emotive verbs as inherently transitive, it will be impossible to account for several interesting semantic-syntactic facts about English and Japanese.

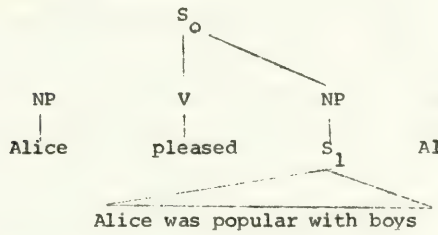
2. Arguments against the Flip Analysis of Emotive Causatives in English.

There is an analysis of English which claims that a fairly large number of 'psychological' predicates such as please, amuse, worry, surprise, etc. are so marked in the lexicon that they obligatorily undergo Flip, a rule which interchanges the subject and the object. This was first

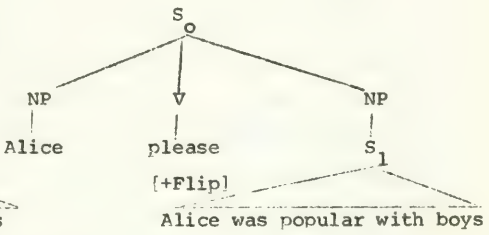
proposed by Lakoff (1965).

Notice that the Flip analysis makes entirely different claims about the properties of emotive verbs and their related constructions such as (16.a), (16.b) and (16.c). Most importantly, it claims that emotive verbs such as pleased, amused, worried, surprised, etc. are inherently transitive verbs. For example, according to the Flip analysis, (16.a) and (16.b) would have deep structures something like (21.a) and (21.b), respectively.

(21) a.




b.




Notice that pleased in (21.a) has two arguments. We have already shown that there are good reasons to believe this is false. Next, the Flip analysis can relate (16.a) and (16.b) but it fails to explain why and how they are related to (16.c). In other words, it is a pure accident that sentences like (16.a) and (16.b) are always related to sentences like (16.c). Also, it fails to explain why pleased in (16.c) lacks an object.

(16) a. Alice was pleased that [she was popular with boys]$_S$.

b. That [she was popular with boys]$_S$ pleased Alice.

c. Because [she was popular with boys]$_S$, Alice was pleased.

Finally, notice that the Flip analysis does not decompose emotive verbs into underlying causatives. Therefore, according to this analysis, (22) and (23) are not related to each other in any linguistically significant way whatsoever. Compare:

(22) That she was popular with boys pleased Alice.

(23) That she was popular with boys made Alice happy.

I will argue below that verbs such as please should be analyzed as underlying causatives and that only by so doing can one capture a very significant generalization in English syntax.[3]

I will present four arguments to justify my claim. First, observe

pairs of sentences like (24) and (25).

(24) a. Alice amused Bill by telling him jokes.

b. Alice amused Bill.

(25) a. Bill tried to surprise Alice.

b. Bill surprised Alice by being under nineteen.

The a-forms refer to an action performed by the subject of the sentence. The b-forms, on the other hand, describe an emotional reaction to the subject of the sentence experienced by the object of the sentence. These examples clearly show that marking those verbs as [+ Flip] in the lexicon does not work, for they can take both Agent and non- Agent subjects as in a-forms and b-forms, respectively. Obviously, Flip is not responsible for the derivation of a-forms. A possible way out from this troublesome situation would be to hypothesize that the English lexicon has many pairs of homophonous verbs such as $\underline{\text{amuse}}_1$, $\underline{\text{amuse}}_2$, $\underline{\text{surprise}}_1$, $\underline{\text{surprise}}_2$, etc. and that only one member of each pair is a Flip verb. This seems to be a plausible analysis and the systematic difference in stress pattern in each pair also seems to support this approach. Now, observe (26) and (27).

(26) a. Alice amused$_1$ him. [əmyuzdhm] (by telling him jokes)

b. Alice amused$_2$ him. [əmyuzdm]

(27) a. Bill surprised$_1$ her.

b. Bill surprised$_2$ her.

Quite interestingly, when the subject of a 'Flip' verb is an Agent, as in the a-forms, h reduction does not take place: h remains. In b-forms, however, h is reduced. This observation is due to Arlene Berman and Michael Szamosi (1971). Now, consider the causative constructions like (28) and (29).

(28) Alice made Bill happy.

(29) Bill made Alice sad.

These sentences can be just as ambiguous as sentences like (24) and (25), although, unfortunately, the stress difference does not show up here. However, consider the following:

(30) a. Alice made him happy.

b. Alice made him happy.

(31) a. Bill made her sad.

b. Bill made her sad.

When the surface object is him or her, the semantic difference is paralleled with h reduction just as it is the case with (24) and (25). What does this imply? It simply implies that English phonology is sensitive to semantic facts of sentences. Nobody will draw the absurd conclusion from (30) and (31) that make in (30.a) and make in (30.b) are different verbs or that happy in (30.a) and happy in (30.b) are different predicates, for example. Assume, on the other hand, that the 'Flip' verbs are underlying causatives and their semantic representations are roughly something like (32).

(32) amuse ≡ CAUSE + amused
please ≡ CAUSE + pleased
surprise ≡ CAUSE + surprised

I have already maintained that an abstract verb CAUSE relates two states of affairs in such a way that because of the first state of affairs the second state of affairs comes about. Then, the real difference between $\text{amuse}_1$ and $\text{amuse}_2$ is simply the difference of the nature of the first state of affairs: whether an Agent is involved in the first state of affairs or not. Therefore, it follows that the difference of deep structures between a- and b-forms in (24) and (25) is parallel to that between a- and b-forms in (30) and (31). It is no mystery at all to our analysis, therefore, that h reduction behaves alike in the 'Flip' constructions and ordinary causative constructions like (30) and (31). Also, notice that our analysis makes the prediction that other predicates of human emotion such as happy, unhappy, sad, sorry, angry, etc. will behave like pleased, amused, surprised, scared, worried, etc. The correctness of this prediction is verified by the following examples. Consider (33), (34) and (35).

(33) Bill was pleased that Alice passed the exam.

(34) Bill was happy that Alice passed the exam.

(35) Bill was aware that Alice passed the exam.

We have already shown that only (33) and (34) are paraphrased by because clause sentences, as illustrated by (36), (37) and (38).

(36) Because Alice passed the exam, Bill was pleased.

(37) Because Alice passed the exam, Bill was happy.

(38) *Because Alice passed the exam, Bill was aware.

Also, we have called the reader's attention to the fact that the clause

introduced by because is identical to the complement of pleased and happy. Furthermore, we have already pointed out that only (33) and (34) are semantically related to a causative construction whose subject is again identical with the complement of pleased and happy.

(39) That Alice passed the exam pleased Bill.

(40) That Alice passed the exam made Bill happy.

(41) *That Alice passed the exam made Bill aware.

According to Flip analyses, (33) and (34) are not related in any linguistically significant way whatsoever. Also, notice that our analysis is in good agreement with our intuitive judgment that pleased, surprised, amused, etc. and happy, sad, angry, etc. constitute a semantically natural class of predicates which denote human emotion and whose surface object NPs denote the cause of emotion

Next, recall that we have pointed out that every causative sentence has a paraphrase with a because clause sentence. Likewise, every 'Flip construction appears to have a corresponding because clause sentence as is illustrated by (39) and (36).

Finally, Karttunen (1970) has pointed out that in affirmative assertions, the causative sentence implies that the proposition contained in the complement is true. Likewise, (42) implies the factuality of (43).

(42) Alice pleased Bill.

(43) Bill was pleased.

For the above reasons, I maintain that the Flip analysis of English verbs such as please, amuse, surprise, worry, etc. is too superficial and fails to explain what is really going on in English syntax and that the so-called 'Flip' verbs in English should be decomposed into underlying causatives.

3. Arguments against Kuroda and Chomsky's analysis

A different proposal has been made to relate sentences like (44) and (45) by Kuroda (1965) and Chomsky (1970).

(44) Alice was pleased that [she was popular with boys]$_S$.
Arisu wa [zibun ga otokonoko ni moteru]$_S$ koto o yorokonda.

(45) That [she was popular with boys] pleased Alice.
[Zibun ga otokonoko ni moteru] koto ga Arisu o yorokob-sase-ta.

First, I would like to discuss Kuroda's analysis. Details aside, the essential difference between the Flip approach and Kuroda's approach is the following. Kuroda also considered pairs of sentences such as (46) and (47) to be true paraphrases of each other. The examples are his.

(46) a. Ongaku ga Taroo o tanosim-sase-ta.
music amused make Pst

'Music amused Taroo.'

b. Taroo ga ongaku o tanosinda.
music amused

'Taroo was amused with music.'

(47) a. Sono koto ga Taroo o nagek-sase-ta.
that fact grieved make Pst

'That fact grieved Taroo.'

b. Taroo ga sono koto o nageita.
grieved

'Taroo was grieved at that fact.'

Instead of postulating that the b-forms are the more basic and that the a-forms are to be derived from the b-forms by a transformation, Kuroda proposed that the b-forms are embedded inside the a-forms. Therefore, the deep structures for (46.a) and (47.a) are claimed to be something like the following:

(48) Ongaku$_i$ ga [Taroo ga ongaku$_i$ o tanosinda] sase ta.

'Music$_i$ made [Taroo was amused with music$_i$].'

(49) Sono koto$_i$ ga [Taroo ga sono koto$_i$ o nageita] sase ta.

'That fact$_i$ made [Taroo was grieved at the fact$_i$].'

Notice that this analysis presupposes that verbs like tanosimu and nageku are inherently transitive. Therefore, in order to get the desired sentences from (48) and (49) it is necessary to delete the complement objects which are coreferential to the main subjects. Kuroda postulated that there is a rule called Recurrent-Object-Deletion in Japanese grammar. 'An object is deleted if it coincides with the subject.' He has correctly pointed out that 'verbs which are subject to Recurrent-Object-Deletion are very restricted. Semantically, they share a characteristic feature in that they convey the emotional state of a human being.' However, he has failed to

realize the following fact: It is only when the main subject is the non-Agent that the complement object must coincide with this non-Agent subject and also must be deleted.

Recall that English Flip treatment has failed to account for 'Flip' constructions whose subjects are Agents. The same thing can be said about the Recurrent-Object-Deletion approach. Consider (50) and (51).

(50) Taroo ga (nyuugaku-siken ni itiban de ukatte) hahaoya o
entrance exam at top grade with passing mother
yorokob-sase-ta.
'Taroo pleased his mother (by passing the entrance exam with the top grade).'

(51) Taroo ga (Amerika musume to kekkon site) hahaova o kanasim-
American girl with marrying sad
sase-ta.
'Taroo made his mother sad (by marrying an American girl).'

Notice that there are no such Japanese sentences as (52) and (53).

(52) *Hahaoya ga Taroo o/ni yorokonda.
'His mother was pleased with Taroo.'

(53) *Hahaoya ga Taroo o/ni kanasinda.
'His mother was sad about Taroo.'

Therefore, it will be totally implausible to say that the deep structures for (50) and (51) are something like the following:

(54) Taroo$_i$ ga [*hahaoya ga Taroo$_i$ o/ni yorokonda] sase ta.
'Taroo$_i$ made [his mother was pleased with Taroo$_i$].'

(55) Taroo$_i$ ga [*hahaoya ga Taroo$_i$ o/ni kanasinda] sase ta.
'Taroo$_i$ made [his mother was sad about Taroo$_i$].'

which contain ungrammatical sentences (52) and (53) as their complement.

It is interesting to note that Chomsky (1970) has proposed an analysis of English emotive causatives which is exactly parallel to Kuroda's analysis. In order to explain the meaning relationship between (56) and (57), Chomsky proposed (58) to be a plausible deep structure for (57). The examples are his.

(56) He was amused at the stories.

(57) The stories amused him.

(58) The stories$_i$ (CAUSE) (he was amused at the stories$_i$)

In place of Kuroda's Recurring-Object-Deletion, Chomsky maintained that 'the operation that erases the repeated noun phrase in the embedded proposition of (iii) (= (58)) is of a sort found elsewhere. For example, in the derivation of such sentences as John used the table to write on, ... from John used the table (John wrote on the table), and so on.' I would like to claim that there is no syntactic evidence whatever that his (iii) (= (58)) and these sentences are related by any general principle such that some explanation applies to both cases. For example, McCawley (December 1971. Personal communication) has pointed out to me that we have to keep the preposition in 'John used the table to write on' but that we have to lose it in (57). The following sentence, therefore, is ungrammatical.

(59) *The stories amused him at.

Notice that our intransitive analysis of emotive verbs predicts that (56) cannot have the corresponding causative form unless at the stories is deleted. This is a correct prediction. Observe:

(60) *Alice amused him at the stories.

(61) Alice amused him Ø.

The examples of the same type follow.

(62) *Alice pleased him with John.

(63) *Alice made him happy about that.

(64) *Alice made him sorry about that.

(65) *Alice disappointed him at the news.

(66) *Alice surprised him at that.

The above ungrammatical sentences become perfectly grammatical when their phrasal objects are deleted.

(67) Alice pleased him.

(68) Alice made him happy.

(69) Alice made him sorry.

(70) Alice disappointed him.

(71) Alice surprised him.

Also, just as every emotive verb sentence with a sentential object is paraphrased with a because clause sentence, we have because of paraphrases for the sentences of the above type.

(72) Because of the stories, he was amused.

(73) Because of the news, he was pleased.

(74) Because of that, Alice was happy.

(75) Because of her father's death, Alice was sorry.

(76) Because of his change of mind, Alice was disappointed.

(77) Because of the unexpected result, Alice was surprised.

For the above reasons, I am quite skeptical about Chomsky's deep structure analysis for (57). I believe the phrase at the stories does not originate in the embedded sentence as in (58) and that it has been extraposed by the Causal Object Formation rule from the underlying subject position of the abstract verb CAUSE.

From the above analysis, it follows that the so-called English pseudo-passives are different from true passives in that Causal Object Formation has yielded the former but Passivization yielded the latter. More precisely, the latter are claimed to be causative passives by our analysis. This explains why the subject of the pseudo-passives is always non-Agent and therefore the predicate is stative. Observe:

(78) He was very amused at the stories.

(79) He was very pleased with the news.

(80) Alice was very disappointed at the result.

(81) Alice was very worried about it.

The same predicates can take the sentential objects.

(82) He was very amused that the stories were so unusual.

(83) He was very pleased that the news was better than he expected.

(84) Alice was very disappointed that Bill married another girl.

(85) Alice was very worried that her son might flunk.

We have already demonstrated in Section 1 that their sentential objects have been derived from the sentential subjects of the underlying causative construction by Causal Object Formation.

## Footnotes

[1]This paper is an adaptation of part of Chapter IV of Akatsuka (1972), Some Aspects of Japanese Reflexivization. I am very grateful to James D. McCawley for suggesting various improvements in this paper.

[2]English stative transitive verbs may occur in non-Agentive causative constructions, as illustrated by the following example.

(i) Biological inheritance makes sons resemble their mothers.

[3]In this paper, I will have nothing to say about other verbs for which the Flip analysis has been proposed, such as seem, appear, etc.

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# NOUN PHRASES AS QUANTIFIERS*

by

Peter Cole

## I. Postal's Extended Cross-over Principle

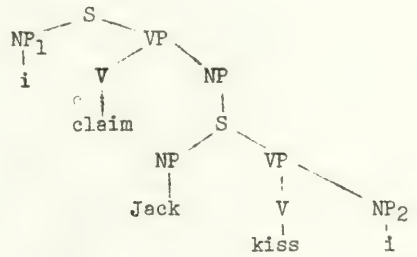
Postal (1971, Chapter 10 inter alia) argues that the fact that (1) is grammatical but (2) is not should be accounted for on the basis of an extended version of the cross-over principle. (For the purposes of this paper I shall consider the extended cross-over principle to be that version of the cross-over principle not limited to clausemates.)

(1) $\text{Who}_i$ claimed Jack kissed $\text{her}_i$?

(2) *$\text{Who}_i$ did $\text{she}_i$ claim Jack kissed?

(A subscript $i$ indicates that the element in question is coreferential with other elements similarly marked.) Sentences (1) and (2) are presumed to be derived from an underlying structure similar to (3).

(3)




In Postal's analysis of (1), Wh-Q-movement applies to $NP_1$. Pronominalization later applies left-to-right, as would be expected. The derivation of (2) is similar to that of (1), except that Wh-Q-movement applies to $NP_2$ rather than to $NP_1$. Consequently $NP_2$ is moved to the left of $NP_1$. Since pronominalization operates left-to-right except into embedded

sentences, $NP_1$ should undergo pronominalization yielding the structure underlying (2). However, (2) is ungrammatical and its derivation must be blocked.

It should be noted that questions having the form of (2) are blocked only if $NP_1$ and $NP_2$ are coreferential. Hence (4) is grammatical.

(4) Who did Mary claim Jack kissed?

Indeed, (2) is fully grammatical if $NP_1$ and $NP_2$ are not coreferential.

Postal explains the ungrammaticality of the coreferential reading of (2) on the basis of the cross-over principle. Although (1) and (2) come from the same underlying structure, the application of Wh-Q-movement to $NP_1$ (in the derivation of (1) ) does not result in that NP crossing over the coreferential $NP_2$. However, when the same rule is applied to $NP_2$ in the derivation of (2), $NP_2$ is moved across a coreferential noun phrase, $NP_1$. Hence the extended cross-over principle is violated in the derivation of (2), but not in the derivation of (1).

It should be noted that for most rules the cross-over principle must be limited to coreferential clausemates. Only in the case of Wh-Q-movement, Wh-rel-movement, and Y-movement does cross-over apply across clause boundaries. If these cases were explicable on the basis of other general principles, the formulation of cross-over would be considerably simplified.

I shall argue that given certain fairly plausible assumptions about the nature of underlying structure, cross-over is not needed to account for the ungrammaticality of (2).

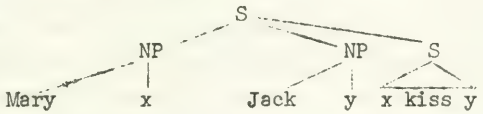
## II. The Keenan Hypothesis

Edward Keenan (1971a, 1971b, forthcoming) has proposed that in order to account for the differing logical properties of sentences with opaque and transparent readings, an under-

lying structure similar to (6) is needed for (5).

(5) Mary kissed Jack.

(6)




That is, the simplex sentence contains only variables. NP's are treated as quantifiers binding variables.[1]

## III. Variable Replacement

If noun phrases have the logical properties of quantifiers binding variables, the transformational apparatus of the grammar must be such that bound variables are replaced by their quantifiers in some derived structures. Thus, in order to derive (5) from (6), the variable x must be replaced by Mary and the variable y by Jack.

Some form of variable replacement is necessary in any theory of grammar. If it is accepted that overt quantifiers like all and some are logically related to the sentences in which they are found in a manner similar to that represented in standard logical notation, then a rule of variable replacement is necessary so that the quantifier may appear within the noun phrase in surface structure. Thus (7) must be related by the grammar to (8).

(7) All men are chauvinist pigs.

(8) $\forall x \in$ man (chauvinist pig (x) )[2]

Such a rule was proposed previously by George Lakoff (1969). Lakoff refers to an apparently identical process as quantifier lowering.

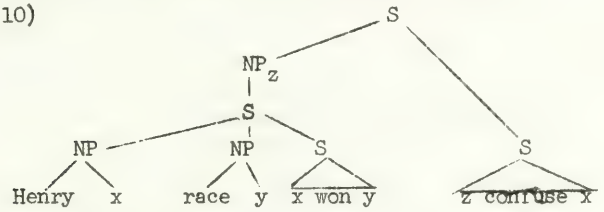
Although the question of whether rules like variable replacement should be considered syntactic transformations or rules of semantic interpretation remains controversial,

the need for a rule like variable replacement somewhere in the grammar is obvious. I shall assume throughout this paper that variable replacement is a syntactic transformation. Of course, some reformulation of my conclusions would be necessary should it turn out that variable replacement must be considered part of a separate semantic component. This matter will be considered further later in this paper.

A somewhat modified rule of variable replacement is necessary in order to derive (9) from an underlying structure like (10).

(9) That Henry won the race confuses him.

(10)




To derive (9) from (10), the noun phrase Henry must replace one instance of the variable it binds. The replacement of variables would follow the normal restrictions on pronominalization, allowing a choice as to whether (10) would be realized as (9) or as (11).

(11) That he won the race confuses Henry.

What is of crucial importance for the purposes of this paper is that a noun phrase may replace on and only one instance of the variable it binds. Hence (12) could not be properly generated from (10).

(12) That Henry$_i$ won the race confuses Henry$_i$.

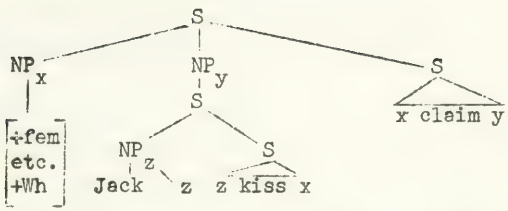
Thus a consequence of the adoption of the proposal that noun phrases have the properties of quantifiers is that the rule of quantifier replacement necessitated by such a proposal

be constrained from replacing more than one instance of a variable by the noun phrase which binds that variable. In general, the variable replaced by the noun phrase would be the left-most instance of that variable, although an instance of the variable to the right of the left-most instance might be replaced by the noun phrase binding it if the instance of the variable to the right is in a sentence containing an embedded sentence $S_1$, and $S_i$ contains the left-most instance of the variable. Variables not replaced by the noun phrases binding them in underlying structure appear as pronouns in surface structure. Of course, the above conditions on variable replacement are directly analogous to conditions on pronominalization in the standard theory.

## IV. Variable Replacement in Place of the Extended Cross-over Principle

I shall now show that the independently motivated restrictions on variable replacement are sufficient to explain the ungrammaticality of the coreferential reading of (2). I will assume that within the general framework of Keenan's system the underlying representation of (1) and (2) is not (3), but a structure similar to (13). The essential difference between (13) and (3) is that in (13) the question element is treated as a quantified noun phrase. Any other treatment of Wh-questions would appear to violate my basic assumption that noun phrases are to be considered quantifiers binding variables. (I do not claim that (13) is an adequate underlying representation for (1); rather, the only claim is that who in (1) derives from a quantifier-like constituent outside the sentence quantified over. The use of syntactic features has only expository significance.)

(13)




In accord with the rules proposed earlier in order to deal with the derivation of (5) from (6) and (9) and (11) from (10), variable replacement would apply to the left-most instance of the variable x. (I am ignoring the replacement of y by $NP_y$. Nothing regarding $NP_y$ is crucial for this example.) After the replacement of x by Wh, Wh-Q-movement would apply vacuously (or not at all). Thus (1) would be generated from (13). That the derivation of (2) would be blocked is apparent from the restrictions on the application of variable replacement. In order to generate (2), the rules of the grammar would have to permit the replacement of an instance of a variable other than the left-most instance by its NP (before Wh-movement). However, the conditions on variable replacement permit this only when the instance of the variable to the right is in a sentence in which the left-most variable is embedded. Since this is not the case in (13), sentence (2) is blocked (i.e., it cannot be derived from (13), where the instances of x are coreferential).

I wish to emphasize that the condition on variable replacement (i.e., pronominalization) is necessary in any theory of grammar. In fact this condition is precisely the backwards condition suggested by Postal (1971, p. 20). The virtue of the analysis I am presenting is that a known and independently motivated principle of grammar is employed in place of a somewhat ad hoc rider on the cross-over principle.

The derivation of (4), as well as the non-coreferential reading of (2), indicate that variable replacement as formulated above, and Wh-Q-movement are sufficiently powerful to account

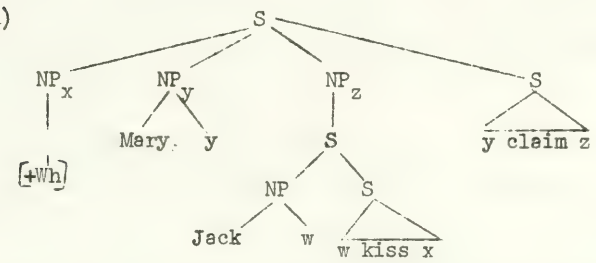
for the full range of cases. Sentences (4) and (2) are repeated here for the convenience of the reader.

(4) Who did Mary claim Jack kissed?

(2) *Who$_i$ did she$_i$ claim Jack kissed?

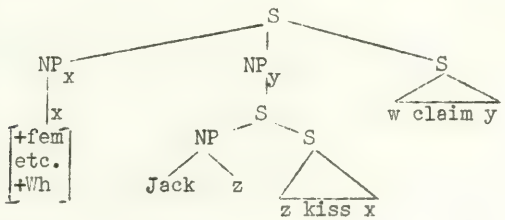
Sentence (4) derives from an underlying structure similar to (13), but containing an additional noun phrase.

(14)




In the case of (4), the bound variable x occurs within only one sentence. Since x occurs only once, it is replaced by the noun phrase binding it. Wh-Q-movement later moves the object of kiss to the front of the entire sentence. A similar process allows the derivation of the non-coreferential reading of (2). In the non-coreferential reading the subject of claim is not bound by the noun phrase NP$_x$.

(15)




Rather, the subject of claim is a free variable, or, possibly, is bound anaphorically to a noun phrase in an earlier sentence.

## V. Wh Marking

In the remainder of this paper I will attempt to show that all of Postal's arguments against the sort of treatment of the phenomena in question which I presented above are flawed. Postal's arguments are of two sorts. First, he claims that only the cross-over principle can account for the proper placement of Wh-elements in relative clauses in sentences like (16). Second, Postal contends that restrictions on some cannot account for the ungrammaticality of the coreferential reading of (2).

(16) The elephant who$_i$ thought he$_i$ didn't like Mary to believe he$_i$ hurt himself$_i$ died of elephantiasis at midnight.

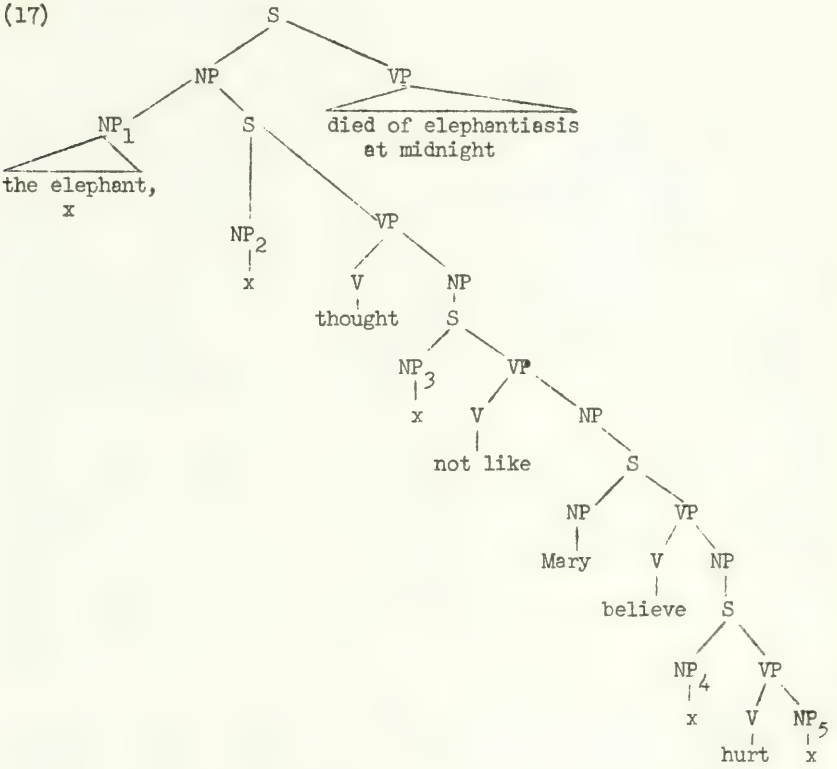
The problem is that of formally specifying the coreferential noun phrase which is marked as the unique Wh form. Postal notes that in sentences like (16) only the left-most coreferential element appears in surface structure as a Wh form. Rejecting an explanation of this fact requiring that pronominalization be cyclical, Postal concludes that

> No other principle of English grammar or of universal grammar is known which predicts this fact. The solution to the pickout problem is the cross-over principle. (p. 247)

However, we saw earlier that in the case of the coreferential reading of (2), the ungrammaticality resulted from the misapplication of variable replacement. Sentence (2) can be coreferential only if the left-most instance of the variable **x** is replaced by the quantifier Wh, which binds it. Intuitively, a similar process would appear to apply in the derivation of (16). Let us assume that (17) underlies (16) at some point in the derivation. (My use of (17), a tree of the sort usually found in transformational grammars, has no theoretical significance. Since the point which I wish to make can be

made equally well with (17) as with a structure more exactly representing the underlying logical relations of (16) (i.e., a Keenan tree like (15) ), the familiarity of structures like (17) suggests that they be employed for expository purposes.)

(17)




The rule of variable replacement would apply left-to-right, marking $NP_2$ with the Wh form. $NP_3$, $NP_4$, and $NP_5$ could not undergo variable replacement (and later Wh-rel-movement) since they are neither the left-most instance of the bound variable x, nor are they in a sentence containing an embedded sentence in which $NP_1$ appears. That is, assuming noun phrases to be quantifiers binding variables, the correct solution to the

problem of marking Wh forms in relative clauses is solved by the application of an exceedingly general principle of variable replacement. Since variable replacement is the direct analogue of pronominalization in the standard theory, it is necessary in any adequate grammar of English.

## VI. Variable Replacement in Relative Clauses

There are some difficulties with the application of variable replacement to relative clauses. Variable replacement has been formulated as an extremely general process accounting for the incorporation of noun phrases as quantifiers into simple sentences which contain only variables in underlying structure. It is obvious that the head noun phrase is not incorporated into any of the instances of the variables it binds in relative clauses. To do so would generate (18) rather than (16) from (17), and (20) rather than (19) from the structure underlying (19).

(18) *Which elephant thought he didn't like Mary to believe he hurt himself died of elephantiasis at midnight.
(19) Tarzan slew the mean old elephant$_i$ who$_i$ thought he$_i$ didn't like Mary to believe he$_i$ hurt himself$_i$.
(20) *Tarzan slew the mean old which elephant thought he didn't like Mary to believe he hurt himself.

It is intuitively clear what the problem is. In the case of relative clauses, the head noun phrase, which presumably binds one or more variables within the relative clause, is not incorporated into the embedded sentence. Instead, the <u>same variable</u>, which in simple sentences and Wh-questions is replaced by the binding noun phrase, is marked as a Wh form and becomes subject to Wh-rel-movement.

Thus, although the explanation of sentences like (16) on the basis of variable replacement seems clearly to capture the correct generalization, it entails a complication

of what was previously an extremely simple and elegant rule of grammar. However, I do not believe that this complication constitutes an argument for the abondonment of the hypothesis that noun phrases are in fact quantifiers. It would be relatively simple to have a separate rule of variable marking (analagous to variable replacement) which would apply to the structural description of relative clauses. Such a solution would seem premature, however. It seems equally plausible that inadequacies in our understanding of the logical relations in relative clauses might account for the apparent enomaly.

Indeed, it is clear that the treatment of relative clauses implicit here is incorrect in part. I have treated the relation between the head noun phrase of the relative clause and the sentence embedded in the relative clause as though it were the same as the relation between a noun phrase and the simple sentence in which it occurs. However, the logical relations between the men and the sentence x arrived are not the same in (21) and (22).

(21) The men arrived. $\prec$ ( (the men, x) x arrived)
(22) The men who arrived $\overset{?}{\underset{?}{\prec}}$ ( (the men, x) x arrived, y)

Ignoring the definite description (which does not seem relevant to this discussion), in (22) the head noun phrase the men specifies a set S = {men}. The following sentence defines a subset of that set: namely, those of the set men who had arrived. This has often been noted to be the usual function of restrictive relative clauses in natural language. It is obvious that no set-subset relation exists in (21). The logical relations of (21) might be paraphrased roughly as follows. Arrival is a predication attributed to all those individuals of the class the men. Of course, the latter is equivalent to saying that arrival is predicated of the variables bound by the quantifier the men.

On the basis of the above examples, it would seem that

the formalism which I have implicitly used for relative clauses does not make the correct empirical claims. Although I cannot show that this is the case, I would hope that a more adequate treatment of relative clauses within the framework of the system developed by Keenan would also eliminate the complication of the rule of variable replacement which I discussed previously. It is not inconceivable that a more insightful treatment of the logical relations in relative clauses would allow the simple form of the rule of variable replacement to be used with relative clauses. The reader should note that the deficiencies in the underlying representation of relative clauses which I have just noted seem to be unconnected to the problem of picking out the left-most instance of a variable in a relative clause..

## VII. Restrictions on Some

In the previous section I showed that the extended cross-over principle is not the only principled explanation of the fact that the left-most coreferential variable in a relative clause is marked as the unique Wh form. In this section I shall consider Postal's discussion of similarities in the restrictions on some and Wh forms.

In Chapter 21, Postal notes that there are similarities between the restrictions on Wh forms and those on some. We have seen that (1) is grammatical given a coreferential reading, but (2) is ungrammatical for that reading. The same pattern is true for (23) and (24).

(23) Who$_i$ first recognized Zeus created him$_i$?
(24) *Who$_i$ did he$_i$ first recognize that Zeus created?

It might be proposed that this pattern is related to the fact that (25) is grammatical, but (26) and (27) are ungrammatical.

(25) Someone$_i$ first recognized that Zeus created him$_i$.

(26) *He$_i$ first recognized that Zeus created someone$_i$.
(27) *X$_i$ first recognized that Zeus created someone$_i$.

Postal recognizes that the apparent restrictions on some in fact comply with the backwards condition on pronominalization. This is shown by sentences like (29) and (30), which would seem to derive from a structure similar to (28).

(28) That Sandy kissed some fink$_i$ was disturbing to some fink$_i$
X$_i$ X$_i$
(29) That Sandy kissed some fink$_i$ was disturbing to him$_i$.
(30) It was disturbing to some fink$_i$ that Sandy kissed him$_i$.

Thus, Postal notes no difference in the restrictions on pronominalization with some quantifiers.

On this basis Postal claims that sentences like (2) and (23) cannot be blocked on the basis of the restrictions on some. Since these restrictions are in fact restrictions on pronominalization, it would have to be the case that the restrictions on pronominalization are stable prior to those on Wh-Q-movement. However, Postal claims to have shown earlier that pronominalization follows Wh-Q-movement. Thus, according to Postal, the restrictions on pronominalization cannot be used to block (2) and (23).

## VIII. The Relevance of Postal's Argument to the Hypothesis that Noun Phrases are Quantifiers

A brief review of how Postal's argument affects the present analysis is in order. My proposal does not attempt to link Wh forms to some or to any particular quantifier. Instead, I claim that all noun phrases are in fact quantifiers (or that they bind variables like quantifiers). Pronouns (in the form of bound variables) are generated in the underlying structure; the first instance of a variable is either replaced by the noun phrase binding it, or is marked as a Wh form in the case of relative clauses, or both, in the case of Wh-questions. It has therefore

been an explicit assumption of my analysis that the analogue of pronominalization, variable replacement, must be allowed to occur before Wh-Q-movement. Hence any valid argument that Wh-Q-movement must always precede variable replacement would be fatal to my proposal. Thus Postal's claim that Wh-Q-movement precedes pronominalization must be examined with greater care, in order to see whether that argument is valid in the case of variable replacement.

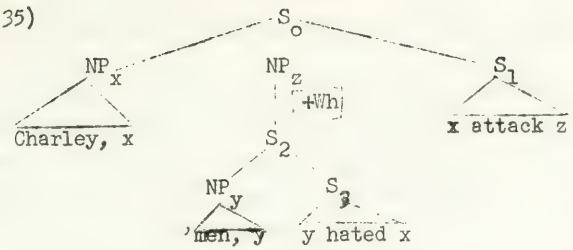
Postal (p. 80) contends that in order to generate both (32) and (33) from (31), it is necessary that Wh-Q-movement precede pronominalization.

(31) Charley$_i$ attacked Wh some of the men who hated Charley$_i$.
(32) Which of the men who hated Charley$_i$ did he$_i$ attack?
(33) Which of the men who hated him$_i$ did Charley$_i$ attack?

If pronominalization precedes Wh-Q-movement, then only the second instance of Charley in (31) is in the correct environment for pronominalization. The first instance of Charley cannot be pronominalized since the conditions for backwards pronominalization are absent. However, if backwards pronominalization cannot apply to (31), then (32) cannot be generated--given the assumption that the correct order is pronominalization, then Wh-Q-movement. However, if Wh-Q-movement precedes pronominalization both (32) and (33) may be generated. Thus Postal concludes that the only possible ordering is Wh-Q-movement followed by pronominalization.

The same arguments which Postal uses with regard to pronominalization and Wh-Q-movement would appear to be valid with regard to variable replacement and Wh-Q-movement. Tree (34) shows the approximate underlying structure (excluding some) of (32) and (33), assuming that noun phrases should be represented as quantifiers.

(35)




If all instances of variable insertion occur before Wh-Q-movement, the following derivations are possible.

a. Insert $NP_x$ in place of x in $S_1$, yielding 'Charley attacked z'. Then insert $NP_y$ in $S_3$, yielding 'the men who hated x'. Next $NP_z$ replaces z in $S_1$, giving as output 'Charley attacked the men who hated x'. Finally, x is rewritten 'him', giving 'Charley attacked the men who hated him'. Upon completion of all variable replacement transformations, the structure undergoes Wh-Q-movement, yielding a final output of 'Which men who hated him did Charley attack?'

b. Insert $NP_z$ in place of z (presumably after $NP_y$ replaces y), yielding 'x attacked the men who hated x'. $NP_x$ is then inserted in place of x in $S_1$. $NP_x$ cannot replace x in $S_3$ since this would violate the backwards condition. After the insertion of $NP_x$ and Wh-Q-movement, the final output would be 'Which men who hated him did Charley attack?', the same output as in a. above.

A general condition on variable insertion would be needed to prohibit the insertion of $NP_x$ into $S_3$ before the insertion of $NP_z$ containing $S_3$ into $S_1$. Otherwise it would be impossible to apply the backwards condition on variable replacement. This is because if $NP_x$ were inserted into $S_3$ before $S_3$ were inserted in $S_1$, then the object of hate in $S_3$ would be the left-most (and only) instance of the variable x in the sentence. Thus x would be replaced by Charley. Upon insertion of $NP_z$ in $S_1$, (35) would be generated.

(35) *$He_i$ attacked the men who hated $Charley_i$.

Given (35) as an input, Wh-Q-movement would produce (36).

(36) Which men who hated Charley$_i$ did he$_i$ attack?

Thus it would seem that in order to generate (36), it would be necessary to predict that (35) is a well-formed surface structure--if all instances of variable replacement must precede Wh-Q-movement. That is, Postal's argument regarding the relative ordering of pronominalization and Wh-Q-movement would appear to be valid with regard to variable replacement and Wh-Q-movement. That this should be the case is not surprising, since variable replacement is intended to be analogous to pronominalization in every way. However, if the correct ordering is Wh-Q-movement and then variable replacement, variable replacement cannot be used to block the generation of (2), since if who is to the left of she at the time variable replacement occurs there is no violation of the backwards condition on variable replacement.

If the possible rule orderings are (a) all instances of variable replacement precede Wh-Q-movement, or (b) Wh-Q-movement precedes all instances of variable insertion, then Postal's arguments in Chapter 21 constitute a refutation of the main claim of this paper--that the rules of variable replacement (pronominalization) necessary for any grammar of English are sufficient to explain the ungrammaticality of sentences like (2). I have contended that no extension of the cross-over principle to those cases is necessary or desirable.

## IX. Wh-Q-movement as an Anywhere Rule

In fact, there is another ordering possibility. If Wh-Q-movement is unordered with respect to variable replacement, the result will be the correct output. That is, I propose that Wh-Q-movement is an "anywhere rule": a rule which applies when its structural description is met.[3] Of course, in a sense Wh-Q-movement would continue to be ordered after variable replacement, since the structural description of Wh-Q-movement requires the prior application of variable

replacement to the noun phrase marked Wh. However, if Wh-Q-movement is an anywhere rule, it would apply as soon as variable replacement moved the noun phrase marked Wh into the sentence. The following derivations demonstrate that if Wh-Q-movement is an anywhere rule, both (32) and (33) can be generated from (34).

c. $NP_z$ replaces z in $S_1$, yielding 'x attacked the men who hated x'. Wh-Q-movement then moves $NP_z$ to the front of the sentence, producing 'Which men who hated x did x attack?'. This intermediate structure is then subject to either forwards or backwards variable replacement. Both (37) and (38) are generated by the rules of the grammar.

(37) Which men who hated $Charley_i$ did $he_i$ attack?
(38) Which men who hated $him_i$ did $Charley_i$ attack?

Since the general condition on variable insertion would prevent the insertion of $NP_x$ into $S_3$ before the insertion of $NP_z$, which contains $S_3$, into $S_1$, the ungrammatical declarative sentence (35) would be blocked.

I believe I have shown that if it is assumed that noun phrases are quantifiers binding variables, and that the transformation of Wh-Q-movement is an anywhere rule in the post-cycle or final cycle, then there is no need to extend the cross-over principle to Wh-questions.

## X. Constraints on Quantifier Crossing: an Apparent Counterexample

If it is the case that noun phrases are quantifiers, as I have claimed, it might be expected that they would obey any constraints which exist on overt quantifiers. By overt quantifier I mean words like all, some, etc. which are represented as quantifiers in standard logical notation. One characteristic often true of sentences with quantifiers--first noted by Noam Chomsky (1957)--is that the passive and active are not paraphrastic. For example, (39) is not synonymous with (40).

(39) All women love some men.
(40) Some men are loved by all women.

This does not seem to be the case with ordinary noun phrases, however. Sentence (41) is synonymous with (42).

(41) Women love men.
(42) Men are loved by women.

Thus it might be claimed that noun phrases cannot be quantifiers since, unlike overt quantifiers, their passives are paraphrastic.

However, a closer consideration of sentences like (41) and (42) suggests that the reason they are paraphrastic is not because they do not contain quantifiers, but rather because the subject and object superficial noun phrases are commanded by a covert quantifier which I shall call the "generic quantifier" (G). The underlying representation for (41) and (42) might be something like (43).[4]

(43) ( (G, x (women, x) ) ((G, y (men, y) ) (y love x)

That is, noun phrases are to be embedded within quantifiers. The synonymy of (41) and (42) would then be explicable on the basis of the fact that the crossing of like quantifiers often produces no change in meaning. That this is true can be seen from the following examples.

(44) All women love all men.
(45) All men are loved by all women.

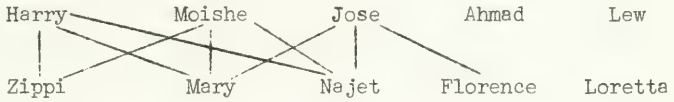
Sentences (44) and (45) are synonymous. This contradicts any claim that the crossing of quantifiers per se results in non-synonymy. It has been claimed that only the crossing of unlike quantifiers is non-paraphrastic. This is not correct, however. McCawley (1970) has pointed out that when sentences containing subject and object noun phrases with <u>most</u> are

passivized, the active and passive do not mean the same.

(46) Most of the boys danced with most of the girls.
(47) Most of the girls were danced with by most of the boys.

I assume most to mean more than half. In situation (48) sentence (46) is true, but (47) is not. Lines indicate who danced with whom.

(48)




Three of the boys (Harry, Moishe, and Jose) danced with three girls. Hence (46) is true. However, only two girls (Mary and Najet) danced with three boys. Thus (47) is false.

In fact, I should not wish to claim without detailed investigation that the crossing of any unlike quantifier results in non-synonymy. If the definite description is a quantifier as has generally been assumed, unlike quantifiers are crossed in (49) and (50). However, no loss of synonymy is immediately apparent.

(49) All of the guys love the new secretary.
(50) The new secretary is loved by all of the guys.

Clearly, a detailed examination of the crossing behavior of natural language quantifiers is called for.[5] Crossing behavior does not seem to me to provide evidence against the hypothesis that surface noun phrases are quantificational.[6]

There may be some question regarding whether it is necessary to posit a new quantifier G for generic noun phrases. One might claim that generics are variants of the universal quantifier. However, the incorrectness of identifying generics with the universal quantifier can be seen from the following examples.

(51) All women love all men.

(41) Women love men.

Sentences (41) and (51) are not paraphrastic. In (51) it is claimed that each individual woman loves each individual man. That is, under universal quantification the relation is predicated of each member of the class quantified over. This is not true for generics, however. Although (41) claims that a love relationship tends to hold between members of the class women and members of class men, it is incorrect to infer from this that such a relationship holds between any particular members of those classes. Thus the universal quantifier and the generic quantifier are not identical.

## XI. Noun Phrases as Predicates

An additional difficulty with analyzing noun phrases as containing quantifiers is intuitive rather than formal. In sentences like (52) the surface noun phrase boys appears to function as a predicate.

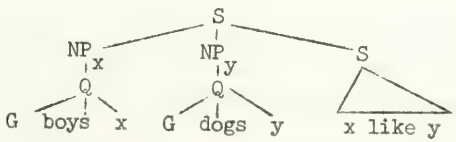
(52) They are boys.

However, in (53) my analysis requires that boys contain a quantifier.

(53) Boys like dogs.

Sentence (53) derives from an underlying structure like (54).

(54)



It would seem at first glance that in some cases surface noun phrases are quantifiers and in other cases they are predicates.

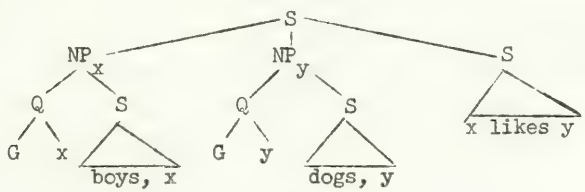
An intuitive inconsistency analogous to this is found in standard logical notation. Standard logical notation would treat both boys and dogs as predicates in (53), but would analyze Thelma and Hildegarde as logical constants in (56).

(55) $\forall(x)$ (boy $(x) \rightarrow \forall(y)$ (dog $(y) \rightarrow$ like $(x,y)$ ) )
(56) Thelma likes Hildegarde.
(57) Like (Thelma, Hildegarde).

Thus standard notation reflects the claim that noun phrases, which in terms of surface syntactic relations seem to function similarly, actually have dissimilar logical properties.

Reducing the problem to its essentials, it is clear that noun phrases have properties generally identified with quantifiers. In particular, they bind variables. It is also clearly the case that noun phrases often have the characteristics of predicates. These qualities are not mutually exclusive. The noun phrase boys in (53) seems to include the predication (52) in some obvious way. It seems useful to express this fact explicitly, as in (58).

(58)




Thus the previous analysis is modified so as to emphasize the dual role of noun phrases: containing both quantifiers and predicates.

At this point I would like to indicate an additional link between noun phrases, quantification, and pronominalization (variable replacement). This link is considerably more tenuous than those which I noted earlier, but still seems worth noting. Earlier

in this paper I noted that Postal's backwards condition must apply to variable replacement. The backwards condition is quite similar in form to constraints on quantifiers proposed by George Lakoff (1969). Roughly, Lakoff proposed that if a quantifier $Q_a$ commands a quantifier $Q_b$ in underlying structure, then $Q_a$ is to the left of $Q_b$ in surface structure, or $Q_a$ commands $Q_b$ in surface structure and $Q_b$ does not command $Q_a$ in surface structure.

The backwards condition can be phrased in an analogous way. If $x_1$ is the left-most instance of a variable $x$ bound by a quantifier Q in underlying structure, then $x_1$ is the left-most instance of $x$ in surface structure, or $x_1$ commands and is not commanded by any other instances of $x$ in surface structure. Lakoff's constraints deal with the position in surface structure of underlying quantifiers, while the backwards condition deals with the position in surface structure of variables bound by quantifiers. Thus the constraints apply to different constituents. The content of the constraints is similar, however, suggesting that the two phenomena in question may be related.

## XII. Variable Replacement: Transformation or Rule of Semantic Interpretation

Earlier in this paper I argued that some rule like variable replacement is necessary in any theory of grammar. I left open the question of whether there is any evidence suggesting whether such a rule is a syntactic transformation or a rule of semantic interpretation. Jackendoff (1969) has argued in his dissertation and elsewhere that pronominalization is a rule of semantic interpretation. Lakoff (1969) explicitly claims that quantifier lowering is a cyclic transformation. Until the development of the extended standard theory, it was generally assumed that pronominalization was a transformation. Within the framework I have proposed pronominalization, quantifier lowering, and variable replacement are different names for the same phenomenon. What I would like to consider here is whether, assuming the correctness of my analysis, there is any reason to believe that variable replacement is

a syntactic transformation. I shall argue that there is in fact evidence to that effect.

Crucial to my argument is the assumption that Wh-Q-movement is a syntactic transformation. Although it is not impossible that the preposed forms found in Wh-questions are generated by the base, this would lead to a host of problems. In particular, it would have to be claimed that sentences with transitive verbs lacking objects are grammatical, but that they are marked anomalous by the semantic component in those cases where there is no preposed Wh form.[7] This analysis would seem unable to capture the fact that sentences with objects and Wh questions asking about those objects are intuitively a unitary phenomenon. I shall therefore assume that Wh-Q-movement is a syntactic transformation.

Although Jackendoff et al. are less than explicit on this matter, there is reason to believe that the supporters of the interpretive framework would like to distinguish between syntactic transformations and rules of semantic interpretation in the following way. Although syntactic transformations can be input to rules of semantic interpretation, interpretative rules cannot be input to syntactic transformations. However, if my analysis is correct, the output of variable replacement must be input to Wh-Q-movement. Thus, since Wh-Q-movement is a syntactic transformation, its input must also be a syntactic transformation.

I conclude that if my analysis is essentially correct, and if Wh-Q-movement is a syntactic transformation, then variable replacement must also be a syntactic transformation. Of course, the acceptance of variable replacement as a syntactic transformation would in no way show that the bifurcation of the rules of the grammar into syntactic transformations and rules of semantic interpretation is incorrect. However, it would seem counter to the spirit of the lexicalist hypothesis if rules with the intuitively "semantic" character of variable replacement were to be included in the syntactic component. I would hope that this would raise some question as to the fruitfulness of the division of the rules of the grammar in this way.

## Footnotes

*Many of the ideas in this paper reflect my reaction to proposals made by Edward Keenan during his lectures to the Seminar on Mathematico-Philosophical Semantics, which he conducted together with John Corcoran at the 1971 Linguistics Institute. The possibility of treating the phenomena which Paul Postal explains by the extended cross-over principle as an example of quantification was suggested by Jerry Morgan during classroom discussion of Postal's Cross-over Phenomena. I have elaborated Keenan's and Morgan's suggestions considerably, and they obviously bear no responsibility for errors in my analysis.

Thanks are due to the Mathematical Social Science Board and to the Center for English as a Second Language, Southern Illinois University, for supporting my participation in the Seminar on Mathematico-Philosophical Semantics.

[1]This is a simplification of Keenan's position. It is beyond the scope of this paper to explicate Keenan's motivation for positing underlying structures like (6). An earlier system with similar logical properties is presented in Keenan's dissertation (1969); his current position was presented in lectures at the 1971 Linguistics Institute and to some extent in Keenan (1971a and 1971b). A full exposition will appear in Keenan (forthcoming). In these works Keenan presents syntactic and semantic justification for the treatment of surface noun phrases (including proper nouns) as having the properties attributed to quantifiers in standard logics. Note that a somewhat similar proposal was independently put forward in McCawley (1967).

For the purposes of this paper, it is sufficient to note that if Keenan's claim that his system constitutes an adequate treatment of logical presupposition in sentences with transparent and opaque readings is correct, this fact provides an independent motivation for the treatment of putative cross-over phenomena on the basis of general principles necessary for Keenan's system.

[2]Or, $\forall x$ (man$_{(x)} \rightarrow$ chauvinist pig$_{(x)}$ ) in unrestricted quantifier notation.

[3]Presumably, Wh-Q-movement is an anywhere rule anywhere within the post-cycle (or final cycle).

[4]I realize, of course, that until a formal semantics for G is proposed in which the truth and falsehood conditions for G are rigorously specified, these remarks are conjectural.

[5]Lynette Hirschman has made a detailed study of the effect of quantifier crossing in the case of universal and existential quantifiers.

[6]In order to claim that all noun phrases are quantificational I should be able to demonstrate that there is reason to believe that all noun phrases without overt quantifiers contain covert quantifiers.

Jerry Morgan has noted some data which suggest that covert quantifiers do not behave identically to overt quantifiers. In Morgan's dialect (i) and (ii) are grammatical, but (iv) is not.

(i) Joe goes downtown when he gets up.

(ii) When he gets up, Joe goes downtown.

(iii) Each boy goes downtown when he gets up.

(iv) *When he gets up, each boy goes downtown.

For Morgan pronouns bound anaphorically to overt quantifiers may not precede their antecedents. This is not the case in regard to pronouns bound to covert quantifiers. I have no explanation for these facts at present.

[7]These facts were pointed out to me by Jerry Morgan.

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# INTENSIVE REFLEXIVES

by

Richard J. Leskosky

While reflexive pronouns have been analyzed and found to have important implications for transformational grammar study, the closely related phenomenon of the intensive reflexive has been ignored, perhaps on the assumption that in itself it is uninteresting or that it at least has nothing to contribute beyond the insights garnered from the study of the other reflexive pronouns. This paper will examine some of the facts of intensive reflexives--henceforth, merely intensives--relate these to other facets of the grammar, and raise some other questions without providing any answers to them.

1.0 Preliminaries.

1.1 Meanings. The main concern of this article is not to delineate all the possible semantic readings which may be attached to the intensive, but cursory research on my part in this area has shown there to be at least three possible readings for most intensives. Since some of the sentences to be cited later may not allow for all three readings and may consequently lead to unnecessary skepticism regarding the data and the conclusions drawn therefrom, these three interpretations will be dealt with briefly here.

1.1.1 "Personally." The intensive often, if not always, carries the force of the adverb personally when referring to a human antecedent. Thus

1 I myself have found numerous examples of this phenomenon.

is synonymous with

2 I personally have found numerous examples of this phenomenon.

and

3 John himself wouldn't do that.

can carry the implication that while John personally might not do it he might have someone else do it for him.

This particular reading of the intensive as meaning the same as personally can cause some problems since it cannot be applied to all instances of the intensive. This is definately the case when the intensive appears referring to inanimate objects, and "personally" interpretations of the intensive when applied to animate non-human objects would be subject to various ad hoc considerations.

1.1.2 "Even." The intensive in many instances carries the force of even--that is, it establishes its antecedent as the upper or lower bound on some scale of values. Thus

4 The pope himself wouldn't pass up free dope.

is equivalent to

5 Not even the pope would pass up free dope.

both of which imply that everyone up to and including the pope would accept gratis grass.

It should be noted that this interpretation suggests itself primarily when the intensive's antecedent is well known and when the situation itself implies some sort of polarity or usually unexpected quality. Sentence (1) receives an even interpretation only if the speaker assumes himself not to be the sort to discover examples, and the intensive in

6 Nixon himself will vote Republican in '72.

would generally be accepted as having only the personally interpretation whereas

7 Nixon himself will vote Democrat in '72.

can have the even interpretation as well and, in fact, will have it as its primary interpretation.

1.1.3 Emphsis/sort of "even." This interpretation may actually be a lumping together of two separate readings; further inquiry would be needed on this point. The function of the

intensive here seems to be solely that of emphasis--the ur-intensive, so to speak. On the other hand, one can view the intensive here as participating somewhat in the even function noted above, but with the difference that there is no scale involved except insofar as there must be something with which to compare the antecedent to give it importance. This should be clarified by the following example.

8 I snubbed Spiro Agnew himself yesterday.

means not that I snubbed everyone up to and including the Vice-President, but rather that I snubbed one individual whose importance I wish to emphasize. Note that a similar reading is not possible in

9 (?) I snubbed my paper boy himself yesterday.

unless one has extreme feelings of inadequacy or unless someone like the editor of the Tribune delivers one's papers.

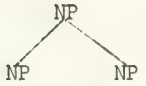
1.2.0 Relation to reflexives. Are intensives really reflexives--a proper subset of those pronouns called reflexives--or do they just look like them and act like them sometimes but really belong to a different class of linquistic entity?

1.2.1 Form. The fact that intensives are identical in form to reflexives would at first glance seem to settle the matter, but actually this is only a peculiarity of English. Even within closely related Indo-European languages this identity is not the case. Latin used different roots and different systems of declension endings for intensives and regular reflexives. German uses the indeclinable selbst for intensification and different, declinable forms for reflexives.

1.2.2 Function.[1]

1.2.2.1 The intensive has already been shown to have at least three interpretations. The ordinary reflexive does not get any of these interpretations under normal stress and can get only the last reading--the emphatic--under special stress.

1.2.2.2 The intensive is the most dependent of pronouns, with its natural position immediately following its antecedent--in effect, sharing a node with its antecedent as in the following structure.




The only time it is moved from this position is when an optional rule extraposes it to the end of the sentence or into the verb phrase. But either immediately following its antecedent or extraposed elsewhere, the intensive cannot occupy alone any slot in a sentence where a noun phrase would ordinarily go. That is, the intensive in

10 I saw Big Ed himself coming down the street.

is acceptable in a regular NP slot by virtue of its immediately following its antecedent and sharing a node with it. But

11 *I saw himself coming down the street.

is ungrammatical (except in motion-picture Irish brogue) since intensives may not stand alone in normal NP slots.

Reflexives, on the other hand, appear in just those positions where intensives do not (namely, as independent noun phrases) and do not appear where intensives do (immediately following their antecedents or extraposed elsewhere).[2]

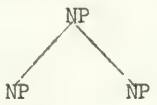
1.2.2.3 Intensives and reflexives behave differently with respect to movement rules. Intensives can optionally be moved to the end of the sentence or into the verb phrase in certain cases and, as will be shown later, cannot be moved to the left. Reflexives cannot be extraposed but can be moved to the left as in topicalization.

Actually, the fact that reflexives cannot be extraposed is trivial in any discussion of whether intensives are really reflexives since this merely harkens back to the fact that reflexives do not appear in the same position as intensives and therefore could not meet the structural description called for in the extraposition rule. Similarly, general constraints on movement rules will prevent intensives from moving to the left, again owing to the structural description of intensives. The whole question of different behavior with respect to movement

rules devolves back into the question of positional differences between intensives and reflexives.

1.2.3 All this discussion of position within the sentence merely shows that intensives and reflexives are in complementary distribution. Rather than arguing that they are separate sets this fact could be used to argue for their belonging to the same set of linguistic entities (at least in English). Then, too, one would obviously want the same rule to convert underlying NP's into the pronominal forms that both intensives and reflexives take rather than separate rules for each; and in fact the reflexiviation rule as currently accepted will do just this without the structural description having to specify any difference between intensives and reflexives.

The only thing arguing against intensives and reflexives being the same things is that the intensive carries more semantic information than the reflexive. This could perhaps be explained by some more involved and abstract structure underlying the relatively simple structure




which this paper assumes to be the source of intensive pronominalization as a working hypothesis. Anything more abstract than the above structure is beyond the scope and intention of this paper.

2.0 Intensives in simple sentences.

2.1 Intensives can appear with noun phrases in virtually any regular position in a sentence, as the following examples illustrate.

12 Agnew himself gave Nixon this copy of Mein Kampf.

13 She snubbed Nixon himself yesterday.

14 I gave Eustace himself the money.

15 I gave the money to Eustace himself.

16 In Boston itself you can't buy Boston baked beans.

17 In 1970 itself there were more traffic fatalities than in the entire first decade of automobile production.

18 The ghost of Captain Kidd himself walks these shores at night.

19 That man is the dean himself.

The only exception[3] to this occurs with possessives of the -'s type, where no combination of the possessive marker and the intensive is workable.

20 *This is Lyndon's himself barbecue pit.

21 *This is Lyndon('s) himself's barbecue pit.

2.2 Although intensives may appear in almost any NP slot in the sentence, they cannot appear with every noun phrase. To merit an intensive a noun phrase must be characterized by definiteness or particularity. As the following examples show, indefinite noun phrases cannot be accompanied by an intensive.

22 Hiding behind the door was (*a man / J. Edgar) himself.

23 In (*some countries / Borneo and New Guinea) themselves jungles abound.

24 *For (centuries / two hundred years) themselves men have been trying to fly.

It should be noted, in conjunction with an earlier section of this paper, that intensives and reflexives differ in this respect also since reflexives can refer to indefinite antecedents.

25 (Someone) could injure himself with this faulty saw.
(A man )

2.3 Although intensives may follow a noun phrase in any position in a sentence, it is not the case that they behave the same in all these positions. Actually, since intensives' behavior is more or less limited to the application of the optional extraposition process noted earlier, the differences in behavior are readily apparent.

26 Julie gave Nixon this book herself.

27 *Tricia married Eddie Cox today himself.

28 *Julie gave Nixon this book himself.

29 *Julie gave the raspberries to Nixon yesterday himself.

30 *In Boston you can't get Boston baked beans itself.

31 *The platform of Wallace is an affront to intelligence himself.

32 ?*That is John Wayne in the saddle himself.[4]

It is evident that the process of intensive extraposition cannot take place unless the intensive and its antecedent are in the subject position. Furthermore, as the following sentences show, it is the derived subject which is crucial to the operation of the rule and not the underlying subject.

33 Many people dislike Agnew himself.

34 Agnew himself is disliked by many people.

35 Agnew is disliked by many people himself.

36 Mary was amused at John himself.

37 John himself is amusing to Mary.

38 John is amusing to Mary himself.

39 Joyce herself disliked Agnew after his last speech.

40 Agnew was disliked by Joyce herself after his last speech.

41 *Agnew was disliked by Joyce after his last speech herself.

42 Mary herself was amused at John yesterday.

43 John was amusing to Mary herself yesterday.

44 *John was amusing to Mary yesterday herself.

The fact that the derived subject is crucial here indicates that there is an ordering relationship between

intensive extraposition and other rules in the grammar--at least Passivization and Flip. If Extrapositon precedes Passivization, then (35) can be derived from (33), but only if there is some condition which will permit extraposition from non-subject position (which was seen to be not allowable) if the sentence is later to be passivized. Since Intensive Extraposition is optional, it does not have to apply, and in this case Passivization would derive (34) from (33). This ordering, however, would also allow (41) to be generated as an acceptable sentence, with Extraposition and then Passivization applying. One would need another condition ruling out extraposition from subject position if the sentence were later to be passivized. These would both be rather strange conditions.

On the other hand, if Extraposition is ordered after Passivization, then all the grammatical sentences can be generated, but not the ungrammatical ones. Thus, Passivization would derive (34) from (33), and then Extraposition would produce (35). Also, (39) can be passivized to (40), but the restrictions on Extraposition (which it was seen were needed in simple straightforward active sentences) prevent (41) from being derived from (40).

In the case of ordering between Flip and Intensive Extraposition a parallel argument obtains, with the correct order being Extraposition following Flip.

3.0 Intensives and movement rules. Since Intensive Extraposition moves one element over others in a sentence and since the structure of antecedent and intensive as considered here is that of

it would be expected that intensives and their extraposition process would be governed by the constraints on movement

described by Ross. In fact they do--with some minor eccentricities--as will be discussed in this section. Also discussed here is a quirk in the extraposition process itself which while perhaps having nothing to do with movement constraints is a movement phenomenon, which accounts for its inclusion at this point.

3.1 First of all, it is to be noted that Intensive Extraposition, like ordinary Extraposition (which will henceforth be called It-Extraposition here), takes the right member of a complicated NP[5] and moves it to the end of the sentence. This is mentioned not to imply that these two are instances of the same rule, but only to point out that Intensive Extraposition conforms in some ways to already well-discussed processes.[6]

3.2 Extraposition is blocked by the Co-ordinate Structure Constraint:

45 Mike and I and Ted Kennedy himself read dynamically.

46 *Mike and I and Ted Kennedy read dynamically himself.

3.3 While intensives can be moved to the right by extraposition, nothing can move them to the left without their antecedents. Nor can the antecedent be moved to the left without the intensive.

3.3.1 Topicalization of either antecedent or intensive fails--even from subject position, which seems to be a special position for intensives:

47 Agnew himself wouldn't vote for Nixon in '72.

48 *Himself, Agnew wouldn't vote for Nixon in '72.

49 *Agnew, himself wouldn't vote for Nixon in '72.

Of course, topicalization of the intensive would be a blatant violation of the Cross-over Condition; and topicalization of the antecedent would be a violation of the Left Branch Condition.

3.3.2 The intensive itself cannot be questioned.

50 Bill himself did it.

51 *Who did Bill do it?

Nor can the antecedent be questioned.

52 *Who himself did it?

Even if Intensive Extraposition is allowed to apply before Question Formation the result is still unacceptable:

53 *Who did himself?

although on another reading this can be accepted as a sort of echo question.

To question the intensive--besides being semantically ridiculous--would be to violate the Cross-over Condition. The reason that the antecedent cannot be questioned is simply that no questioned element can be the antecedent of an intensive. This is not quite the tautology it seems: a questioned element is by definition an indefinite element--or so it appears in any analysis of questions--and, as it has already been seen, the intensive is incompatible with an indefinite noun phrase. Therefore, it is more the case that intensives are blocked from appearing in questions rather than that Question Formation is blocked from applying to intensive antecedents.

3.4 Extraposition is imperative in imperatives.

54 *Yourself do it.

55 Do it yourself.

56 *Yourself wait in the car.

57 Wait in the car yourself.

The straightforward explanation of the data is that Intensive Extraposition is ordered before the transformation which results in the imperative's surface form (by deleting the antecedent <u>you</u>). If extraposition does not occur, then the imperativization transformation is blocked. But it seems that there is more to be gotten from these facts than an elementary exercise in rule ordering. If the deletion of the deep subject <u>you</u> in the imperative can be regarded as an instance of reordering of an element, a chopping rule, then, since it is this <u>you</u> which is the antecedent of the intensive in the underlying NP, the necessity of breaking up the antecedent-intensive NP before the imperativization

transformation could apply would conform to the Left Branch Condition that "no NP which is the leftmost constituent of a larger NP can be reordered out of this NP by a transormational rule." Thus the extrapositon phenomenon in this case has larger theoretical ramifications in that there seems to be a justification for this particular rule ordering on the basis of a condition operable over the rest of the grammar.[7]

3.5 Up to this point Intensive Extraposition has been treated as though it only operated in one manner--namely, taking an intensive form from a subject NP and moving it to the end of the sentence. Even if this description is amended so that the intensive is extraposed to the end of an embedded sentence--as later will be seen to be the case with relative sentences--this is not the whole picture. Unlike It-Extraposition, Intensive Extraposition can move elements to places other than the end of the sentence, and in fact intensives seem to have something of an adverbial quality in that they fit easily within the verb phrase.

58 I have myself found numerous examples of this phenomenon.

59 Ralph Nader could himself be a presidential candidate in '72.

60 Agnew would himself join the Ku Klux Klan if he had the chance.

61 You can yourself see that this is true.

62 You may yourself leave now.

63 Ky should himself be on patrol in the rice paddies.

64 Martha Mitchell is herself going to cause more trouble for the administration than any group of dissenters.

65 Allen Ginsberg is himself a narc.

Thus far, if one were to characterize the environment into which intensives can be extraposed within the VP it would be following forms like <u>have</u>, <u>be</u>, and modals--in fact, after the environment (constituent?) discussed by Chomsky:

$$\text{TNS} \begin{pmatrix} \text{have -EN} \\ \text{Modal} \\ \text{be} \end{pmatrix}$$

Furthermore, it would appear that the intensive cannot appear between the main verb and its object--that is, in the environment V__NP. Whether this has any relation to the fact that adverbs cannot appear in this environment either, I have no idea; there is no obvious reason why it should.

66 *Dillinger shot (himself / (in cold blood)) the bank guard.

67 *Nixon wants (himself / (desperately)) Agnew to retire before '72.

68 *Bill does not contribute (himself) money to worthy causes. (readily)

This apparent constraint does not hold, however, when the object of the verb is itself a sentence:

69 Dillinger admitted (himself / (under pressure)) that he shot the guard.

70 Nixon wishes (himself / (desperately)) that Agnew would retire.

71 Ari said (himself / (in private)) that he couldn't stand Jackie.

On the other hand, as (67) shows, the intensive cannot immediately precede a for-to complement.[8]

As yet, I have no explanation for the involvement of the intensive in the verb phrase, but in any case that is not the concern of this study. The foregoing data were presented to show further interesting aspects of intensives and Intensive Extraposition without really hoping to explain them.[9]

4.0 Intensive Extraposition in complex sentences.

4.1 Relativization and intensives. Although relativization does interact with certain facets of the intensive, there seems to be no crucial relationship with the extraposition of intensives. On the other hand, there is a constraint on relativization involving intensives which is indirectly connected with extraposition.

4.1.1 The intensive itself cannot be relativized. Given the sentences

72 John Wayne himself acts in many Westerns.

73 John Wayne himself hates horses.

it is not possible to embed the latter in the former with a grammatical sentence as the result if it is the intensive which is relativized. The result is, rather, the ungrammatical

74 *John Wayne himself who John Wayne hates horses acts in many Westerns.

Since Relativization preposes the relativized element, the application of this process to the intensive--besides being semantically odd--would be ruled out by the Cross-over Condition.

4.1.2 The antecedent, on the other hand, can be relativized:

75 Bill, who himself is no card player, tried to tell me how to play my hand.

76 Bill, who is no card player himself, tried to tell me how to play my hand.

This process interacts with extraposition is no interesting way, except insofar as the intensive is extraposed to the end of the embedded sentence only and no farther--that is, not to the end of the highest sentence, as in

77 *Bill, who is no card player, tried to tell me how to play my hand himself.

(where the intensive is to be understood to originate in the relative clause).[10]

4.1.3 One interesting fact to be noted about intensives and Relativization is that if the antecedent of an intensive is relativized it can undergo this process only if it is in subject position.

78 Nixon, who gambled in the Navy himself, belongs to a church that disapproves of gambling.

79 *Bill, (who himself Gladys shot), had refused to marry her.
(who Gladys shot himself)

80 *Adolf, (to whom himself I gave the book) burned it immediately.
(to whom I gave the book himself)

Thus whether the relativized antecedent takes the intensive with it or leaves it behind when it is fronted, the result is an ungrammatical sentence if the antecedent is anything but the derived subject of the relative clause. This, however, is

also the only position (that is, derived subject) from which the intensive may be extraposed. At first glance it might seem that some sort of transderivational constraint is at work here, but perhaps there is some less exotic explanation.

The Left Branch Condition would certainly rule out the first forms of these sentences since they seem to parallel the grammatical

81 Frank James, whose brother John Ford shot, gave up his outlaw career.

where the leftmost NP of a higher NP has been relativized in object position and the higher NP preposed.

It might very well be the case that Pied Piping must have another condition added to it to rule out its applying in this case to prepose the intensive along with its antecedent. This would prevent any antecedent intensive NP in non-subject position from being relativized since then the intensive could neither be taken along (because of the new condition) nor remain behind (because of the Left Branch Condition). On the other hand, Relativization in subject position would be allowable since the preposing part of the transformation would apply vacuously to the antecedent--that is, it would not affect the constituent structure of the embedded sentence.

Adding another condition to an already condition-ridden convention such as Pied Piping seems at least a little more preferable than bringing in a device as powerful and of such different order as a transderivational constraint.

4.2 For-to complements, Subject Raising, and intensives.

As noted earlier, intensives can appear in virtually any NP position in a sentence provided they share the NP node with their antecedents, but they can be extraposed only from subject position. The first half of this statement is in part substantiated by

82 I expected Bill himself to drive the car.

wherein the intensive appears in a noun phrase in object position. The second half of the same statment seems to be contradicted, however, by

83 I expected Bill to drive the car himself.

which is an acceptable sentence with an intensive extraposed apparently from object position. Does this mean that Intensive Extraposition has further conditions or exceptions attached to it, or is something else at work here?

Of course, there is a complicating factor here. Up to this point the discussion has primarily been concerned with the behavior of intensives in simple sentences, but here there is interaction with the for-to complement construction. This brings in the process of subject-raising which one would certainly expect to have an effect on Intensive Extraposition since extraposition can only take place from subject position.

4.2.1 There are three possible explanations of the relationship between (82) and (83). First, Subject-Raising raises the complete antecedent-intensive NP from subject position in the complement into object position in the next higher S, which produces (82). Then a derivational constraint allows the intensive to be extraposed from object position just in case this object was the derived subject of the complement immediately before Subject-Raising took place. Second, Subject-Raising may raise either the whole antecedent-intensive NP or just the antecedent. If the former is the case, then (82) is the result; if the latter option is selected, then an obligatory rule extraposes the otherwise stranded intensive to produce (83). This obligatory rule is needed to eliminate sentences like

84 *I expected Bill to himself drive the car.

Third, Extraposition, which as already seen is an optional rule, can apply before Subject-Raising. If it is applied, then (83) is the result once Subject-Raising does apply. If

the option of extraposition is not exercised, then Subject-Raising raises the entire antecedent-intensive NP into object position, and (82) is the result.

Now the first hypothesis, that involving the derivational constraint, accepts the data as an exception to the already established constraints on Intensive Extraposition and then pulls in the powerful device of the Derivational Constraint to resolve this difficulty. But the difficulty is resolved with the barest minimum of descriptive adequacy, no insight into the workings of intensives or extraposition, and no relevance to the rest of the grammar except insofar as it might provide another justification for the theory of derivational constraints.

The second hypothesis is the most ragged of straw men since it explicitly violates the Left Branch Condition by raising the antecedent out of the complement while leaving the intensive behind. An ad hoc rule is then necessary to convert this ungrammatical sentence into the correct result.

The third hypothesis is definitely the most promising in that it preserves and conforms to the already described phenomena of intensives, it involves no violation of constraints, and it may have further significance for the grammar beyond a merely descriptively adequate analysis of intensives. A further discussion of this hypothesis follows.

4.2.2 In working with the third hypothesis mentioned above, the question of rule-ordering is important. Is Intensive Extraposition cyclic, pre-cyclic, post-cyclic, or last cyclic?

It has already been seen in sentences like (83) and is further verified in the following that Extraposition applies before Subject-Raising in these cases.

85 I consider John to be a fool himself.

86 The police believed Bill to have driven the car himself.

But since Intensive Extraposition works on derived subjects only, as in

35 Agnew is disliked by many people himself.

87 Marat was stabbed by Charlotte Corday himself.

88 Pat was suspected of infidelity by Dick herself.

it has already been noted that Intensive Extraposition must apply after Passivization.

Passivization and Subject-Raising are both cyclic, and, as has been shown by other researchers, the order of their application within the cycle is Subject-Raising before Passivization. But Intensive Extraposition was seen to apply before Subject-Raising and after Passivization, which results in the order: Extraposition, Subject-Raising, Passivization, Extraposition. This repetitive ordering means either that Intensive Extraposition is cyclic or that since Subject-Raising and Passivization can occur an indefinite number of times within a sentence there must be an indefinite number of Intensive Extraposition rules. This latter is obviously untenable, and so Intensive Extraposition must be cyclic.

The following sentences show that on the last cycle, at least, Intensive Extraposition must follow Subject-Raising.

89 I consider John to be a fool myself.

90 The FBI agent believed Sarah to have driven the car himself.

91 Pat expected Nixon to lose the '68 election herself.

This indicates that the correct order is Subject-Raising, Passivization, Intensive Extraposition. At this point it could very well be objected that sentences (89), (90), and (91) do not provide the best evidence for such a claim since they do not contain any passives which might enter into the ordering phenomenon. If the highest S is passivized and then an intensive extraposed from the subject thereby

derived, however, certain ambiguities arise--namely, the object which is moved by Passivization into subject position in the highest S originated as the subject of the embedded S before Subject-Raising raised it into object position, and because of this every sentence with a for-to complement and the next-higher S passivized would be ambiguous since the intensive could have been extraposed from either S.

92 Sarah was believed to have driven the getaway car herself.

93 Nixon was expected to lose the '68 election himself.

94 John was considered to be a fool himself.

The above sentences bear this out since each has two readings which depend for their differences on which S the intensives are understood to be extraposed from.

4.2.3 Continuing this line of the discussion, it is evident that in a sentence like

95 Seymour is reputed to have been believed to have been expected to have eaten the bagel himself.

the intensive can be extraposed from the highest S or from any of the series of complements where Seymour himself had been the subject at a stage when Intensive Extraposition could apply to it. Thus the sentence should be four ways ambiguous.

Similarly, in sentences where the subjects of a series of for-to complements are dissimilar, an intensive should be able to appear with any of the raised subjects and should moreover be permitted to be extraposed from any of these complements before Subject-Raising applies. Thus, in

96 Gladys believed me to have expected Harry and John to have ordered Seymour to eat the bagel (herself / myself / themselves / himself)

each of the intensives listed is an allowable candidate for extraposition originating in the same structures that underlie

97 Gladys herself believed me to have expected Harry and John to have ordered Seymour to eat the bagel.

98 Gladys believed me myself to have expected Harry and John to have ordered Seymour to eat the bagel.

99 Gladys believed me to have expected Harry and John themselves to have ordered Seymour to eat the bagel.

100 Gladys believed me to have expected Harry and John to have ordered Seymour himself to eat the bagel.

respectively.

It may be the case, however, that an individual reader may not be able to distinguish the fourfold ambiguity of (95) or may not be willing to accept all the entries in (96) because some of them might sound strange. I am sure that more complicated sentences--or at least longer ones--would certainly sound less acceptable. What is at work here may be some sort of constraint on the length of the string over which an intensive may be extraposed. Certainly

101 We the people of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defense, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America ourselves.

might give one pause to consider the suitability of the intensive, even though the Preamble, albeit a lengthy sentence, is less complicated syntactically than any of the readings of (96). Stick an extraposed intensive into one of William Faulkner's marathon sentences, and the mind at the very least boggles.

But rather than some distance constraint limiting extraposition syntactically, it seems more likely that what is at work here is a limitation of the short-term memory. It may be that to disambiguate sentences with multiple for-to complements or merely extra-long sentences the extraposed intensive must be given the same intonation as its antecedent. That is, in (95) and (96) there is a steadily falling tone

throughout the series of complements, and it may be that short-term memory runs into problems trying to recapture the tone of one of the intermediate members in the series in order to give the intensive the same tone.

In any case, it is undoubtedly some performance factor which complicates the sentences with series of complements rather than some syntactic constraint.

4.2.4 Finally, with respect to for-to complements and Intensive Extraposition, it is interesting to note that the order Subject-Raising, Passivization, Intensive Extraposition is the same order followed for It-Extraposition. This is not to suggest that Intensive Extraposition and It-Extrapcsition are the same process; but their functions are similar, and they are similarly ordered with respect to other, major rules. Any further connection remains to be seen.

5.0 Nominalizations and Normal Nominals.

As noted early in this paper, intensives are incompatible with the possessive form of the noun. At the same time this is not quite true in the case of POSS-ing nominalizations.

102 *John's himself driving the truck upset me.

103 *John('s) himself's driving the truck upset me.

The above sentences are obviously no good, but if extraposition occurs, the result is acceptable.

104 John's driving the truck himself upset me.

But (104) cannot be derived from the ungrammatical (102) or (103), so Intensive Extraposition must take place before complementizer placement. Furthermore, it must be the case that if the intensive is not extraposed the POSS-ing type of complementizer is blocked from applying.

In my dialect at least there is a related complement form in which extraposition is optional.

105 Nixon himself fighting in Viet Nam is a ludicrous thought.

106 Nixon fighting in Viet Nam himself is a ludicrous thought.

Of course both forms are acceptable here since no possessive is present.

In action nominals of the POSS-ing-of form the circumstances are entirely different; these are structures of the type

107 John's driving of the truck upset me.

108 Chomsky's shooting of the hunters will get him into trouble.

As expected, the intensive is not allowable immediately following its antecedent.

109 *John('s) himself('s) driving of the truck upset me.

110 *Chomsky('s) himself('s) shooting of the hunters will get him into trouble.

But in this case extraposition is also not allowable.

111 *John's driving of the truck himself upset me.

112 *Chomsky's shooting of the hunters himself will get him into trouble.

Whether this indicates that action nominals are not derived from underlying sentences or that the transformation that does derive them from underlying sentences applies before Intensive Extraposition and is blocked by the presence of an intensive immediately following its antecedent or even some third possibility is a question for further study. At present, however, there seems to be no convincing argument for either position that can be based on the behavior of intensives themselves.

6.0 Conclusion.

It has been shown that such a minor part of the grammar as intensives and their extraposition interact in interesting ways with other, more important and general facets of the grammar. Intensives behave at times like nouns and at other times like adverbs and so perhaps are not precisely the same beasts as reflexives. Extraposition of Intensives is a cyclic rule ordered after Subject-Raising and Passivization, and certain apparent quirks and idiosyncracies--like obligatory

extraposition in imperatives--have been shown to be regular and to conform to various constraints originally noted by Ross.

Other questions such as why intensives extrapose into some places in verb phrases but not into others and why intensives are not compatible with action nominals have been posed but not answered.

Still other questions such as what interactions do intensives have with cleft and pseudo-cleft sentences or with sentences of the type

113 Let them do it themselves

have neither been asked nor answered, but hopefully will be.

NOTES

1. . .A blatant violation of the dictum "Form follows function!"

2. . .Also note that by virtue of node-sharing with its antecedent the intensive may appear in subject position whereas the reflexive cannot.

3. . .Actually, there is another position where the intensive is impossible--namely, with the direct address:
*John yourself, you may open the window.
*Julie yourself, put down that whip.

4. . .Upon further consideration of sentences of this type I am no longer certain that extraposition is incorrect here. If it is acceptable, however, I think that that fact would not complicate my analysis of intensive extraposition but would rather throw some light on the status of the verb be.

5. . .I use this term to avoid calling the antecedent-intensive combination a Complex NP and any consequent implication that the structural description of the antecedent-intensive node is $[_{NP}\ \bar{S}]_{NP}$. This probably is the case at a more abstract level of representation, but at present I am not prepared to make such a powerful claim. By "complicated NP" I refer merely to the structure $[_{NP}\ \bar{X}]_{NP}$ where X is a non-null variable.

6. . .Actually, I suspect they might be two aspects of the same rule, but cf. the sentiments expressed in the preceding note.

7. . .A similar ordering of rules and an identical justification of the rule order apply to the following data. If someone were to call you a bastard, a possible response would be
"Oh, bastard yourself!"
but certainly not
*"Oh, yourself bastard!"

NOTES

8. . .It is also the case that intensives can get involved in factives in a strange way:

Dillinger admitted it himself that he shot the guard.

This apparently is an instance of both types of extraposition applying: first, Intensive Extraposition and then, It-Extraposition moving the factive around the intensive.

9. . .A further complication involving intensives in the VP arises when negatives are present.

John Wayne has (himself never) taken acting lessons.
(never himself)

Eric Segal does (not himself ) admit to being a hack.
(*himself not)

Segal is (himself not) a good writer.
(not himself)

In some instances it seems the intensive must follow the negative, and in others it seems that it may either precede or follow the negative.

10. . .Another complication involving relatives and intensives can be seen in

A man who himself indulges in coprophagy can hardly be expected to condemn it as a failing in others.

where the embedded sentence cannot be

*A man himself indulges in coprophagy.

which is ungrammatical since intensives are incompatible with indefinite NP's.

# FURTHER COMMENTS ON INSTRUMENTALS

by

Richard J. Leskosky

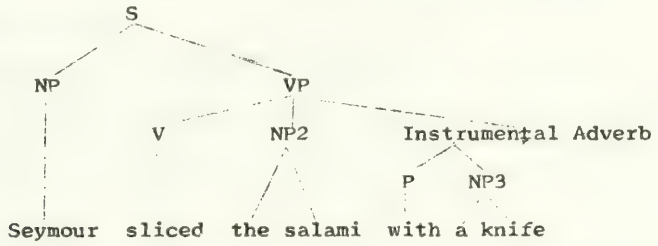
## 0. Introduction

In his 1968 work on instrumental adverbials[1] Lakoff provided a number of arguments for the position that the two sentences

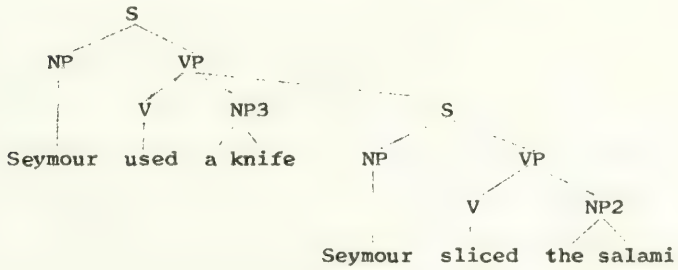
1a) Seymour sliced the salami with a knife.
1b) Seymour used a knife to slice the salami.

must have the same deep structure rather than the separate structures usually postulated at that time:

2a)




2b)




His contention was that the single structure underlying the two sentences would necessarily have to be more abstract than the representation of deep structure subscribed to by Chomsky or else

the conditions used to characterize this latter concept of deep structure would have to be abandoned.

The rejoinder from the group of linguists supporting Chomsky's position appeared in an article by Joan Bresnan[2] the following year. Bresnan attacked a number of points in Lakoff's analysis of the instrumental adverbial construction and maintained that the deep structures of the two forms of the adverbial were in fact distinct.

This paper is intended as a rebuttal to Bresnan's article. Rather than recapitulate all of Lakoff's arguments as well as Bresnan's I shall deal directly with the latter's objections and alternate explanation of the similarity between the two forms and discuss only those of Lakoff's arguments specifically attacked in Bresnan's article.

1.0 Objections to Lakoff's arguments

1.1 Lakoff cites the following sentences[3] to demonstrate that NP2≠NP3 is a constraint common to the two sentence forms.

3) I scratched the wire with a knife.

4) I used a knife to scratch the wire.

5) *I scratched the wire with (it / itself).

6) *I used the wire to scratch itself.

Given structures 2a and 2b, Lakoff notes that the ungrammatical sentences above would have to be ruled out by the following constraints

> A) the object of the preposition in an instrumental phrase cannot be identical to the direct object of the main verb
>
> B) the object of use cannot be identical to the object of the verb in the complement sentence following use.

According to Lakoff these strange constraints occur nowhere else in

English grammar and their correspondence in these constructions is stranger still if their deep structures are essentially different. In his view a correct grammatical analysis would express the two above constraints as a aingle constraint.

In an attampt to counter this argument Bresnan cites[4] the "for-dative" as a construction which demands a constraint between the object of the verb and the object of a preposition:

7) Seymour called me a porter. (=Seymour called a porter for me)

8) *Seymour called me myself. (=*Seymour called me for myself)

9) Seymour brought Harry a concubine.

10) *Seymour brought Harry himself.
(=*Seymour brought Harry for himself)

She points out that in this respect instrumentals and datives behave the same, "are strikingly different from other phrases, and surely must be treated in special ways."[5] As an example of this special treatment she offers another exceedingly strange rule to the effect that the antecedent of an oblique noun phrase in a verb phrase must lie outside that verb phrase ("operate across a verb").

There are, however, two points which can be made against this position.

1.1.1 First, although the dative and the instrumental may be strikingly different from other phrases they are also strikingly different from each other and for Bresnan to categorize them together under this same constraint leaves her open to the same charge of overgeneralization that she lays against Lakoff.

The dative but not the instrumental can undergo the Dative Shift Transformation. Thus

11) Seymour called me a porter.

12) Seymour gave me a salami sandwich.

can be derived from

13) Seymour called a porter for me.

14) Seymour gave a salami sandwich to me.

but when an analogous transformation is performed on 1a the result is the unacceptable

15) *Seymour sliced a knife the salami.

This difference leads in turn to a further difference between the two constructions--namely, the dative (once it has undergone Dative Shift) can be passivized but the instrumental (that is, the instrumental in its with form) cannot.[6] Thus

16) I was called a porter by Seymour.

17) I was given a salami sandwich by Seymour.

can be acceptably produced, whereas the following sentence would be ruled out since it could not have met the structural description required for passivization to occur:

18) *A knife was sliced the salami by Seymour.

Lastly, the instrumental also has the constraint that the subject cannot be identical to the object of the instrumental preposition:

19) *Henry broke the window with himself.

The dative, on the other hand, has no such constraint, as evidenced by sentences like

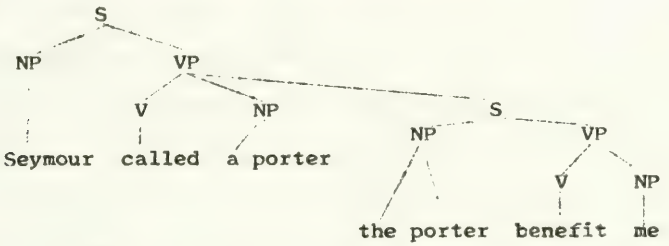
20) Seymour bought a book for himself.

21) Seymour bought himself a book.

1.1.2 Second, even if Bresnan is allowed to generalize about the dative and the instrumental as similar structures obeying a similar

constraint, it can nevertheless be argued that a more abstract interpretation of the dative explains the phenomenon at least as effectively as Bresnan's oblique object constraint yet does so in accordance with a constraint already needed in the grammar. Specifically, the constraint in the _for_-dative sentences which Bresnan cites could be explained by the presence of an underlying verb _benefit_ so that the deep structure of 7 would be something like

22)




_Benefit_ belongs to that class of verbs (like _murder_, _kidnap_, _assassinate_, and _use_) which cannot take an object identical to the subject. Sentences like 8 and 10 would then be ruled out on the grounds that

23) *I benefit myself.

is ungrammatical.

1.1.3 Bresnan's attempt to use the dative to defend her idea of deep structure only militates against that concept in the end, for if the dative and the instrumental are to be taken as operating under the same constraint this can be meaningfully done only within the context of a more abstract notion of deep structure wherein both instrumental and dative would be derived from underlying verbs.

1.2 Bresnan offers as partial counterevidence to Lakoff's argument the fact that there are many dialects in which

24) Seymour used a knife to slice the salami with.

is acceptable.[7] This is taken to indicate that 1a may be embedded in 1b. If such were the case, Bresnan points out, some similarities in co-occurrence relations and selectional restrictions between the two sentences would be expected (namely, those Lakoff pointed out). On the other hand, differences like those Bresnan claims between the sentences would also be possible.

- This argument could be dismissed with the assertion that it was not such a dialect Lakoff was describing. A more honest and meaningful approach to the problem is forestalled by the lack of further data on the dialects mentioned--for example, whether the with is an optional or an obligatory constituent of the structure and whether it is fully acceptable or only marginally so. It could be suggested, however, that the redundant with is purely a surface phenomenon which occurs because of a mistaken analogy made by the speaker on the basis of sentences like

25) Seymour brought a knife to slice the salami with.

1.3 The most serious allegation Bresnan levels against Lakoff's argument is that his claim about the synonymity of the two instrumental forms is false. Given theoretical assumptions current in 1968-69, if two sentences have the same underlying structure they are necessarily synonymous. If their underlying structures are different, it is not necessary that they have the same meaning; and Bresnan holds that one could expect some differences in meaning in this case since one deep structure contains the additional morphological material use while the other does not. She offers the following examples of such differing selectional properties as support for her claim that 1a and 1b have different deep structures.

26a) All at once Seymour broke the door open with a bat.

27a) Seymour finally managed to open the door with his penknife.

28a) Seymour rapidly sliced the salami with a knife.

are respectively not synonymous with the following doubtful sentences:

26b) ?All at once Seymour used a bat to break open the door.

27b) ?Seymour finally managed to use his penknife to open the door.

28b)??Seymour rapidly used a knife to slice the salami.

This problem arises from the fact that if these two instrumental forms have the same underlying structure it must be such that it can allow either the use S or the +ACTIVITY S to appear in surface structure as the primary S with the other S embedded immediately below it--that is, either use or the +ACTIVITY verb may command the other, but they cannot command each other simultaneously. The problem is further complicated by the fact that when use--the underlying verb--becomes embedded in such a structure it appears in its prepositional form with.

As Bresnan pointed out,[8] use and slice (or any other verb which is +ACTIVITY) obviously have different selectional restrictions. The differences between the a and the b forms of 26, 27, and 28 which she ascribes to the "peculiar selectional properties" of the "additional morphological material" use in the use versions are actually due to the differing properties of whichever verb it is that commands the other in the respective sentences. That is, in the sentences given by Bresnan if use is chosen in deep structure to command slice, break, or open it in turn is immediately commanded by another verb (taking the surface form of either a verb or an

adverb). The selectional restrictions of these higher verbs would prevent the appearance of a verb like use in the next S below them, as evidenced by the unacceptability or dubious acceptability of

29)??All at once Seymour used a bat.

30) ?Seymour finally managed to use a penknife.

31) ?Seymour rapidly used a knife.

Therefore, the b versions of 26, 27, and 28 are unacceptable because use cannot meet the selectional requirements of the higher verb. In the sentences where the +ACTIVITY verb commands the underlying use it is the +ACTIVITY verb which must meet the restrictions of the higher verb in order for the sentence to be acceptable. In the a versions of the above sentences this condition has obviously been met, and the sentences are acceptable.

Thus, Bresnan is only partially right in her analysis. The unusual properties of use are responsible for the unacceptability of 26b, 27b, and 28b, but not because of the mere presence of use but rather because of its position in the deep structure and because of the filtering selectional requirements of the verb above it.

2.0 Bresnan's alternate system

2.1.1 Bresnan next attempts to show the superiority of her own system by providing an alternative explanation for the phenomena discussed by Lakoff, the first such instance being those examples showing that an instrumental cannot be embedded in another instrumental. "For this class," she asserts, "there is crucial evidence showing that instrumental adverbs must be syntactically defined in deep structure rather than transformationally derived."[9]

Lakoff relates the ill-formedness of sentences like

32) *Henry broke the window with a chisel with a hammer.

to the nonoccurrence of the instrumental reading for sentences like

33) *Henry used a hammer to use a chisel to break the window.

Bresnan notes that Lakoff gives no motivation for the nonoccurrence of the latter type of sentence and then goes on to state that these facts are only superficially related, that Lakoff's is a false generalization. She holds that there are limitations on the number and kind of adverbial phrases associated with any given verb and that it moreover is necessary to subcategorize verbs for lexical insertion on this basis. Verbs that take instrumental adverbials she calls "I-type verbs." Apparently there are no verbs which take more than one instrumental, and this fact is expressed in the Lakoff-rejected theory of deep structure by the Phrase Structure Rules which provide for only one Instrumental Adverbial per VP.[10] Since use and a number of semantically related verbs (for example, employ, and utilize) cannot take "oblique objects of the appropriate kind" (that is, instrumentals) they are not to be considered I-type verbs. This I-type verb category is supposedly useful in explaining the fact that when use has a verb-phrase complement the embedded verb must be an I-type verb (provided that the complement is the type under discussion here). Bresnan calls this "Condition I." Since use is not an I-type verb it cannot fulfill Condition I and so cannot complementize itself--in other words, sentences like 33 are ruled out.

2.1.2 Bresnan's argument continues along these lines, but this serves as a convenient point to pause and raise a number of objections.

First, if all verbs are subcategorized on the basis of the kind and number of adverbial phrases they take, then there must be a set of M-type verbs that take varying numbers of manner adverbials, T-type verbs that take certain time adverbials, D-type verbs that take durative adverbials, and so on indefinitely, since every time a new type of adverbial is distinguished from the rest all verbs must be subcategorized with respect to it. Correspondingly, there must also be Conditions M, T, D, and so on indefinitely, added to the grammar to explain similarities parallel to those exhibited by the instrumental construction discussed here.

All these listings of verbs according to the kind and number of adverbials that they take is no doubt satisfying to certain types of researchers interested in taxonomics, but it reveals nothing about grammar and in fact beclouds the issue. Mere listing provides no meaningful generalizations. Moreover, the degree of overlap of these verb categories is high in the extreme and again provides no insight but only further confusion.

Second, assuming that Bresnan's ideas about I-type verbs and Condition I were correct, she still could not account very well for the non-existence of the with phrase in the S embedded immediately below the use S. In other words, although only I-type verbs can appear as embedded immediately under use-verbs they nevertheless cannot take in this situation the adverbial which qualifies them as I-type verbs. In her earlier discussion of sentences like 24 she suggested by way of explanation that 1a may actually be embedded in 1b. Here in her discussion of resultative clauses (those embedded immediately below use) one can see the point of her earlier mention

of the dialect phenomenon. Given this sort of structure (that is, 1a embedded in 1b) the identical NP naming the instrument in the embedded S can be deleted through some sort of identity-deletion condition. But this does not account for the non-existence of sentences like

34) *Seymour used a hammer to break the window with a chisel.

Here Bresnan must rely upon certainly the strangest of all the strange constraints she defends--an identity constraint between the direct object of the main verb and the object of a preposition in an embedded S.

Third, although Lakoff gives no motivation for the non-existence of sentences like 33, there is a reasonable constraint which accounts for this phenomenon and which is needed for other verbs as well. Most verbs do not tolerate an embedding of an identical verb immediately below them whether the subject of the embedded S is the same as or different from the subject of the main S[11] as, for example, in

35) *Seymour sliced the salami to slice the bologna.

36) *Seymour sliced the salami for Alvin to slice the bologna.

Other verbs can be embedded as complements to themselves with either an identical or a different subject in the embedded S:

37) I forced Earl to force Tom to marry my ugly sister.

38) I forced myself to force Tom to marry my ugly sister.

Finally, there is a class of verbs which cannot be embedded as complements to themselves when the subject of the embedded S is the same as the subject of the main S but can when the subjects are different:

39) Alvin expected Carl to expect him to arrive at six.

40) *Alvin expected himself to expect to arrive at six.

41) *Alvin expected to expect to arrive at six.

42) I supposed Fischer to have supposed himself to play chess better than Petrosian.

43) *I supposed myself to have supposed Fischer to play chess better than Petrosian.

Use is simply a member of the first and largest of these groups and cannot be embedded under itself as a complement. This constraint, which applies to most verbs, accounts for the nonexistence of sentences like 33. Given Lakoff's system, this also accounts for all cases in which instrumentals within instrumentals are unallowable.

2.2.1 Bresnan classifies the S embedded below use as a "resultative clause" but gives no syntactic characterization of it. Her Condition I "specifies that the result of using an instrument must be something that it is possible to do with an instrument."[12] Verbs like know are not I-type verbs and would violate Condition I if they were embedded below use-verbs. This would explain the nonexistence of sentences like

44) *Seymour used a slide rule to know the answer.

Bresnan goes on to try to demonstrate the necessity of having a Condition I. Condition I, as mentioned above, demands that verbs embedded in resultative clauses below use must be I-type verbs. Lakoff's constraint demands that these verbs be +ACTIVITY. Bresnan cites a number of verbs like consider which are +ACTIVITY but not I-type verbs. That consider is +ACTIVITY is evidenced by the acceptability of sentenees like

45) I forced John to consider the alternatives.

46) I was considering becoming a beekeeper.

But consider cannot be used in instrumental sentences, as in

47) *I used (a book ) to consider it.
(my mind )
(a computer)

48) *I considered it with (a book ).
(my mind )
(a computer)

To Bresnan this demonstrates that Condition I accounts for data which Lakoff's theory cannot account for and so is more acceptable. The necessity of having a Condition I to explain the above data then justifies a nonsemantic characterization of instrumentals.

2.2.2 I find, however, that Bresnan's supposed counterexamples (specifically, the behavior of the verbs she cites) actually form an argument of their own for the semantic characterization of instrumentals and for other structures as well.

Certain verbs presuppose or subsume certain instrumentations in their meaning. Thus, the following sentences spoken with normal intonation and stress are semantically unacceptable (or, at best, exceedingly strange) because of the redundancy caused by the presence of the instrumentals.

49)??I strangled Seymour with my hands.

50)??I used my hands to strangle Seymour.

51) *The dog bit John with his (mouth).
(teeth)

52) *The dog used his (mouth) to bite John.
(teeth)

53) ?Bill shot John with a gun.

54) ?Bill used a gun to shoot John.

55) *I (heard ) the concert with my ears.
(listened to)

56) *I used my ears to (hear ) the concert.
(listen to)

The above sentences are redundant since the verbs themselves in unmarked or unspecified usage convey all the relevant information about the instrumantation used:

57) I strangled Seymour.

58) The dog bit John.

59) Bill shot John.

60) I (heard ) the concert.
(listened to)

Instrumentals of both forms <u>can</u> appear with these verbs if they specify further or mark the instrument, as evidenced by the perfect acceptability of the following.

61) I strangled Seymour with (that ghastly tie of his).
(only my left hand )

62) I used (that ghastly tie of his) to strangle Seymour.
(only my left hand )

63) Grandpa bit the dentist with (his one good tooth ).
(his new store teeth)

64) Grandpa used (his one good tooth ) to bite the dentist.
(his new store teeth)

65) Bill shot John with a blunderbuss.

66) Bill used a blunderbuss to shoot john.

67) I listened to the concert with both ears.

68) I used both ears to listen to the concert (and didn't pay any attention to Clarissa's prattle).

All these sentences specify the particular type of the general instrument presupposed (for example, blunderbuss, a particular type of gun) or mark it as being not the expected instrument (strangulation

using a neck tie instead of bare hands, for instance). Sentences like

69) I strangled Seymour with my own hands.

70) I heard it with my own ears.

are examples of an intensification marking analogous to the intensive reflexive in sentences like

71) I strangled Seymour myself.

72) I heard it myself.

Just as bite presupposes teeth and strangle presupposes hands as instrumentation in the unmarked state, so do Bresnan's +ACTIVITY, -I verbs presuppose the mind in general, some particular mental process, or the vocal apparatus as instrumentation. The difference is that the instrumentation in these latter cases is of a more inalienable nature and the alternatives are extremely limited (if they exist at all) or only figurative. In fact, her -I verbs can take instrumentals in certain marked cases like the following

73) She considered (accepting) his proposal with her heart rather than her brain.

74) She used her heart rather than her brain to consider (accepting) his proposal.

Finally, Bresnan's inclusion of a book and a computer in her sample sentences which appeared here as 47 and 48 can really have no bearing on her argument since these sentences would be semantically anomalous in the same way

75) *Bill shot John with a knife.

is semantically anomalous.

2.3.1 Bresnan offers a final proof for the necessity of a Condition I by citing a set of verbs with two senses, one +ACTIVITY but not

I-type and the other +ACHIEVEMENT and I-type. Examples are swim, run, climb:

76) *I forced Harry to use a breast stroke to swim.

77) He uses special racing shoes to run. (=in order to)

78) He was forced to use Marvel crampons to climb. (=in order to)

This set of sentences shows the impossibility of using an instrumental with the first mentioned sense (+ACTIVITY, -I) of these verbs, while such a possibility with the second sense (+ACHIEVEMENT, -I) is demonstrated in the following sentences.

79) He used a breast stroke to swim the Hellespont.

80) He plans to use special racing shoes to run the race.

81) He used Marvel crampons to climb Mt. Everest.

Bresnan obviously takes this as proof that her Condition I is explaining data that Lakoff's +ACTIVITY constraint cannot account for.

2.3.2 Eschewing the subject of the underlying status of the objects of her +ACHIEVEMENT verbs and of the validity of the above structures as actual instrumentals, one can still point out a major flaw in her argument. As she demonstrates the two categories +ACTIVITY and +ACHIEVEMENT they are not mutually exclusive; in fact, +ACHIEVEMENT not only does not imply -ACTIVITY--which would be the case if they were mutually exclusive--but rather entails +ACTIVITY. Thus, +ACHIEVEMENT verbs are actually a proper subset of +ACTIVITY verbs. All Bresnan has shown is that not all senses of all +ACTIVITY verbs can be embedded below use-verbs. She has shown Lakoff's discussion of instrumentals not to be in error but merely to be somewhat too general in one minor aspect. Even this minor flaw is done away with, however, when one considers that Lakoff's constraint is that

verbs embedded as verbal complements to use must be +ACTIVITY and not that all +ACTIVITY verbs must be able to be embedded as verbal complements of use. Thus, the last of Bresnsn's objections to Lakoff's article is done away with.

## 3.0 Conclusion

In this paper I have shown that Bresnsn's arguments against Lakoff's treatment of instrumentals can be answered and her own assertions handled more simply and economically within the framework of Lakoff's ideas on the same subject. Hopefully, this has also produced some additional arguments for a more abstract notion of deep structure.

NOTES

1 Lakoff, George. "Instrumental Adverbs and the Concept of Deep Structure," Foundations of Language, Vol. 4, No. 1, February, 1968.

2 Bresnan, Joan W. "On Instrumental Adverbs and the Concept of Deep Structure," Quarterly Progress Report No. 92, Research Laboratory of Electronics, Massachusetts Institute of Technology, January 15, 1969, pp. 365-375.

3 All sentences taken from the Lakoff and the Bresnan articles have been renumbered.

4 Bresnan, op. cit., p. 367.

5 Ibid., p. 367.

6 It should be noted that the only way to produce a passive sentence that has the instrument in subject position is to passivize the use form of the instrumental:
A knife was used by Seymour to slice the salami.

7 Bresnan, op. cit., pp. 367-8.

8 Ibid., pp. 368-9.

9 Ibid., p. 369.

10 Bresnan uses this opportunity to again link the instrumental with the dative by pointing out that, similarly, only one dative is allowed per VP--apparently ignoring sentences like:
The mailman gave me a letter for (my brother ).
(the postmaster)

11 Sentences like
Seymour sliced the salami at five o'clock (in order) to slice the bologna at six.
would not be exceptions to this observation since there is obviously a verb be able which has been deleted (but which is still understood) between the two instances of slice.

12 Bresnan, op. cit., p. 371.

# Some Problems of Verb Agreement

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Verb agreement is commonly assumed to be a very superficial process in both senses of the word: superficial in that the verb seems to agree with a NP that is its subject at a relatively late point in the derivation, and superficial in that it is a simple and uninteresting process. The point of this paper is to show that in the latter sense verb agreement (VA) is far from superficial; that in fact VA is a difficult problem for any theory. Data will be presented to show that VA cannot be stated as a simple transformation.

VA, it seems clear, is a superficial process; for example, it is probably safe to claim that no language has a rule of VA such that the verb agrees with the NP that was its subject in the most underlying structure. Further, one would not expect a language to change by reordering VA to precede rules that it previously followed. In general, if a syntactic rule has the effect of changing the subject of a tensed verb in a way which potentially affects VA, then VA will follow that rule.

Moreover, VA does not seem to feed or bleed any other syntactic rule; there is no rule whose structural description must mention whether a verb has been marked to agree with its subject. It seems most appropriate then to treat VA either as a rule which applies post-cyclically or as an output filter of some sort. Either of these would require a formulation in terms of a global rule. But acceptance of the claim that VA is a global rule is not crucial to the rest of this paper. The point to be explored here is the problem of specifying which NP the V agrees with; in other words, the level in the derivation which the structural description of VA must refer to. The rest of this paper will examine this question.

Three initial assumptions.

I. The subject relation is crucial for VA.

II. VA can be simply stated as a rule with a structural description and a structural change, either as a transformation or as a global rule.

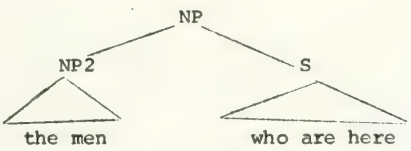
Given I and II, it follows that the subject-verb relation must be structurally defined, since transformations can refer only to constituent structure and category labels.

III. The subject-verb relation is captured by the structural description:

$$\begin{matrix} [\ NP & V & X\ ] \\ S & & S \end{matrix}$$

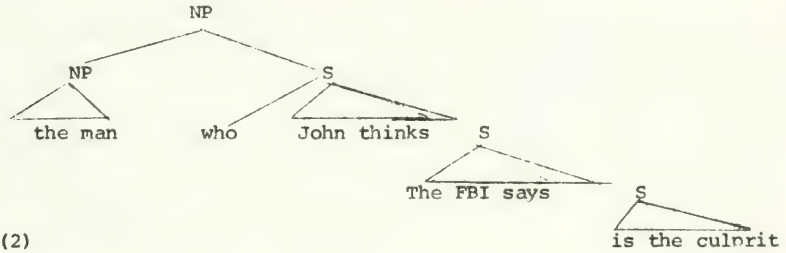
Given these assumptions, it follows that in relative clauses like (1), the verb agrees with some NP within S, the relative clause, rather than, say NP2, the head of the NP.

(1)




Then it follows from cases like (2) that VA must refer to a stage of the derivation prior to the application of Wh-movement, since after Wh-movement applies, the structural description as stated in III is not met.

(2)




A possible analysis consistent with this is that VA refers to some level of the cycle. I will first offer objections to such an analysis, then present data independent of these objections to show that VA cannot be stated to refer to a single fixed level in the derivation. Some alternatives will then be examined.

I. VA as a rule referring to a fixed level.

A. Objections to verb agreement referring to the cycle.

1. General

a. Such a claim implies the claim that if there were a post-cyclic rule changing the subject of a verb, the verb would end up agreeing not with its superficial subject, but with an earlier one. But

perhaps there are no such post-cyclic rules. If so, this is an important non-obvious difference between cyclic and post-cyclic rules.

b. Such a claim necessitates without independent motivation the additional claim that any rule affecting subject-verb agreement (Extraposition[1], Conjunction Reduction, Respectively-formation, for example; I leave it to the reader to construct his own examples) must be a cyclic rule.

2. More particular claims

a. The claim that VA refers to some level within the cycle, i.e. after some cyclic rule(s) but before some other(s).

There are cases which seem to argue for this type of analysis. For instance, one might argue from (3) and (4) that VA must refer to a level prior to There-insertion (a cyclic rule).

(3) There is a man in the room.

(4) There are some men in the room.

But such an analysis is open to at least two objections:

1) It demands an extrinsic ordering statement betweeen VA and There-insertion, thus claiming that there is no explanation for the rules having to apply in this order. It fails to explain why the relationship between VA and There-insertion is a natural one. By comparison, the same ordering relationship between VA and Passive, as in (5) and (6) is not a natural one.

(5) John and Harry have shot Bill.

(6) *Bill have been shot by John and Harry.

2) It treats as accidental the fact that verbs generally agree with their 'closest-to-the-surface' subjects.

b. The claim that VA refers to the end of the cycle; that is, that a verb always agrees with the NP that is its subject at the end of the cycle on the S containing the V.

This claim avoids the two objections to the within-the-cycle analysis, but it requires an ad hoc analysis of There-insertion. Since this analysis (given III) claims that the verb agrees with there, there must be some rule marking there to agree in person and number with the previous subject of the verb. This is a particularly painful problem

for advocates of global rules.

B. Evidence that VA cannot be stated to refer to a single fixed level.

There is an inversion rule relating (7) and (8):

(7) {What / All} John saw was himself.

(8) Himself was {what / all} John saw.

VA must apply after the application of this rule, to account for the difference between (9) and (10).

(9) All I saw was John and Bill.

(10) John and Bill were all I saw.

But if VA refers to a level following the inversion rule, it predicts that (11) is well-formed, and fails to predict the well-formedness of (12).

(11) *Themselves were all they saw.

(12) Themselves was all they saw.

II. Multi-level alternatives.

A. An interesting but incorrect alternative.

An alternative that avoids all the objections and difficulties discussed above is that VA is a searching algorithm operating on derivations, stated roughly as (13).

(13) A tensed verb agrees with the NP that is its most recent possible subject, where 'most recent' is to be interpreted as 'closest to the surface' and 'possible' depends on two factors:

a. It must be possible to determine from lexical or semantic properties of the NP what its number and person are.

b. It must be in the nominative case.

The algorithm applies to make the verb agree with its most superficial subject if conditions a and b are satisfied. If not, it looks back in the derivation to find the next most recent subject, and if a and b are satisfied, makes the verb agree with it, and so on. This analysis

captures the fact that verbs generally agree with their most recent subject, and it avoids the objections to the cyclic analysis. (It is, of course, open to the objection that it uses enough power to cause blackouts all along the Eastern Seabord.)

It accounts for (11) and (12) in the following way: although themselves is in subject position, it is not in nominative case. Therefore the verb agrees with the next most recent subject: the subject prior to the application of the inversion rule.

In the case of There-insertion, a plausible analysis is that there is neither semantically nor lexically marked for person or number, therefore the verb agrees with the subject prior to the application of There-insertion. For those dialects where constructions like this always take singular verbs, as in (14), one could claim that there is lexically marked as third person singular.

(14) There is 30 men at the door.

Unfortunately (or perhaps fortunately) this analysis fails on examples like (15).

(15) There were thought to have been three men in the room.

In this sentence were agrees with three men. But There-insertion applied on the embedded sentence, there then being moved by Subject Raising and Passive to end up as the superficial subject of were thought. Then three men was never at any stage the subject of were thought. Yet were agrees with it. Thus this alternative cannot be maintained.

B. Speculations on a possible correct analysis.

In this section I will try to show what the correct analysis cannot be, by showing that assumptions II and III do not hold.

Assumption II, that the structural description of VA always refers to the same fixed level, was shown to be wrong by the inversion cases (11) and (12). Disconfirmation of III comes from more There-insertion cases. For many speakers, whether the pre-There-insertion subject was a simple plural NP or a conjoined NP is crucial. Thus for them (16) and (17) differ in agreement.

(16) There were two people in the room.

(17) There $\begin{Bmatrix} \text{was} \\ *\text{were} \end{Bmatrix}$ a boy and a girl in the room.

Notice further the difference between (18) and (19).

(18) There {was / *were} two men and a woman in the room.

(19) There {was / *were} a woman and two men in the room.

Moreover, claiming that Assumption III is correct implies the claim that in relative-clause-like structures, properties of the head noun are irrelevant to the operation of VA within the relative clause. This claim is disconfirmed by the following facts: in cleft sentences, the case of a coreferential NP affects the operation of VA, as in (20) through (23)[2].

(20) It's I who speak French.

(21) It's me who speaks French.

(22) It's we who speak French.

(23) It's us who speak French.

It appears in these cases that if the coreferential NP is in nominative case, the verb in the embedded clause agrees with it in person and number; but if it is not in nominative case, the verb is third person and agrees with the pronoun only in number.

The situation is similar but not identical for true relative clauses:

(24) I, who speak French like an Italian, will be your interpreter.

(25) John gave the book to Bill, who speaks French.

(26) John gave the book to me, who he doesn't even like.

(27) *John gave the book to me, who speaks French.

(28) **John gave the book to me, who speak French.

This suggests that person and number agreement should be treated by separate rules or conditions.

The most likely analysis, then, is in the form of a hierarchy of conditions (perhaps separate ones for person and number) roughly of the following content:

The verb must agree with its superficial subject, if possible.
If this is not possible (wrong case, no marking, etc.) then
it must agree with X.

The problem is in specifying X. The <u>There</u>-insertion cases (16)-(19)

suggest that this may be specific to the type of construction. Hopefully a more elegant solution can be found.

## NOTES

[1]The inclusion of Extraposition in this category was based on the difference between (i) and (ii).

(i) To swim backwards and to read Georgian $\left\{\begin{matrix}*\text{is} \\ \text{are}\end{matrix}\right\}$ (both) difficult.

(ii) It $\left\{\begin{matrix}\text{is} \\ *\text{are}\end{matrix}\right\}$ difficult (both) to swim backwards and to read Georgian.

[2]I am grateful to Gene Gragg for the cleft-sentence data.

# APPARENT COUNTEREXAMPLES TO THE COORDINATE STRUCTURE CONSTRAINT: A CANONICAL CONSPIRACY*

by

Susan F. Schmerling

1. In his discussion of the Coordinate Structure Constraint, Ross (1967) noted several English sentences which appeared to provide counterexamples to this constraint:

1. I went to the store and bought some whisky. (Ross's 4-100a)
2. She's gone and ruined her dress now. (Ross's 4-107a)
3. I've got to try and find that screw. (Ross's 4-107b)
4. Aunt Hattie wants you to be nice and kiss your granny. (Ross's 4-107c)

That these are not subject to this constraint is shown by (5-8):

5. Here's the whisky which I went to the store and bought. (Ross's 4-101a)
6. Which dress has she gone and ruined now? (Ross's 4-108a)
7. The screw which I've got to try and find holds the frammis to the myolator. (Ross's 4-108b)
8. Which granny does Aunt Hattie want me to be nice and kiss? (Ross's 4-108c)

Ross pointed out several ways in which a sentence like (1) differed from a true conjoined structure, but as he was principally interested in showing that these were not true counterexamples (he suggested that they were not coordinate structures at the point where the rules in question applied, if ever), he did not discuss such sentences in their own right. Yet it is intriguing to investigate how many such "apparent counterexamples" there are in English. The purpose of this long squib is to point some of them out and to mention several interesting questions they pose for linguistic theory - questions which I am largely unable to answer.

2. The first type of example to be discussed is that exemplified by sentence (1): the first "conjunct" is a directional expression, and the second expresses some activity carried out at

the place to which the movement in the first is directed:

9. John went to Chicago and bought the books he couldn't get in Champaign-Urbana.

10. John came home and read his new books.

The second type is exemplified by sentence (2): the verb of the first "conjunct" is always go,[1] and the verb of the second is always non-stative (cf. (13) below); unlike the first type, however, no idea of motion is conveyed by this type:

11. Gulliver went and spilled cocoa all over his shirt.

12. We were going to have the picnic on Saturday, but then it went and rained.

13. *Charley went and loved Gertrude.

Sentence (4) is an example of the third type, in which the first "conjunct" contains a copula followed by a non-stative adjective, while the second contains a non-stative verb:

14. Henry was sneaky and told them he was spending a few days in the mountains to recuperate.

15. Ernest was finally being honest and saying he had lied to Oran.

The fourth type I want to discuss is not represented by Ross's examples. In this type the first "conjunct" might be considered an instrumental modifier of the second:

16. Lizzie Borden took an axe and gave her mother forty whacks.

17. Polly took some new curtains and brightened the room immensely.

As with the other types, an NP may be moved out of the second "conjunct" in sentences such as these:

18. Who did Lizzie take an axe and whack to death?

19. ?Now here you see the room that Polly took some new curtains and brightened immensely.

While these four types agree in permitting movement of an NP out of the second "conjunct", they differ in that only Type I permits movement out of the first:

20. This is the restaurant where Jake goes every day and eats lunch.

21. *What did Gulliver do and spill cocoa all over his shirt?

22. *What did Dick tell Henry to be and tell them he was spending a few days in the mountains to recuperate?

23. *Over here you see the famous axe that Lizzie Borden took and gave her mother forty whacks.

Thus, even though the Coordinate Structure Constraint does not appear to be applicable in these cases, some other constraint(s) must be invoked to prevent NP movement out of the first "conjunct" in Types II-IV. A corollary to this observation is the suggestion that, even in cases which "look like" coordinate structures and where NP movement is blocked from either "conjunct", it may not be the Coordinate Structure Constraint which is responsible. I have in mind here a type which I shall refer to as Type IVa, which is similar to Type IV in that causation is expressed, but where the first conjunct expresses not instrument but means:

24. Spiro told a little joke and infuriated Paul.

It is impossible to move an NP out of the second "conjunct" in an example like this. However, for some reason an NP moved out of the first produces a sentences which is far more acceptable, although not fully so:

25. *Paul is the guy who Spiro told a little joke and infuriated.[2]

26. ??What was the joke that Spiro told and infuriated Paul?

3.0. It should surprise no linguist who takes semantics seriously that none of these apparent counterexamples involve logical conjunction. That is, since they are structurally different from cases of true conjunction, at least at some level of representation, we should not be surprised to find that a constraint involving coordinate structure does not apply to them. Nevertheless we have seen that NP movement is not freely permitted in these types, and therefore some other constraint(s) must be relevant. In order to determine what constraint(s) <u>are</u> relevant, however, we ought to have a better idea of how such sentences are to be analyzed. Unfortunately I cannot make any concrete proposals as to the proper analyses. Many problems are invol-

ved with each type.

3.1. Ross (1967) states that sentence (1) has a reading which is synonymous with (27)

27. I went to the store to buy some whisky.

suggesting that (1) be derived like other sentences with purpose clauses. However a more careful examination reveals a fundamental difference between a sentence like (1) and a sentence like (27). Compare (28) and (29):

28. I went to the store to buy some whisky, but the salesclerk persuaded me to buy Ripple instead.

29. *I went to the store and bought some whisky, but the salesclerk persuaded me to buy Ripple instead.

A sentence like (1) predicates two actions of the subject: in this case, going to the store and buying some whisky. A sentence like (27), on the other hand, asserts of the subject only that he went to the store. Thus (28) does not express a contradiction, while (29) does.[3]

Furthermore, while there is some kind of intimate connection between the two actions expressed in a sentence like (1), it is not clear that it is one of purpose. A sentence like (30) is impeccable

30. I came home and read the latest issue of Rolling Stone, even though I had intended to do the laundry.

and (31) shows that we are indeed dealing with the "reading" with which Ross is concerned:

31. The latest issue of Rolling Stone is what I came home and read, even though I had intended to do the laundry.

Yet (32), like (29), expresses a contradiction:

32. *I came home to read the latest issue of Rolling Stone, even though I had intended to do the laundry.

Having presented this evidence that sentences of Type I are not to be derived from sentences with purpose clauses, I defer to the reader the question of the correct analysis. I am totally baffled by these sentences.

3.2. The Type II sentences are particularly interesting since no assertion or entailment of motion is involved: this "con-

joined" structure is encoding something very remote indeed from logical conjunction. It seems to me that essentially such a sentence conveys an attitude of mild scorn on the part of the speaker with respect to the act asserted. Contrast the examples in (33):

33a. Clyde won first prize in the raffle.

b. Clyde went and won first prize in the raffle.

(33b) conveys a feeling of annoyance of some kind on the part of the speaker - or perhaps simply amazement because he would never have expected Clyde to enter a raffle in the first place. Note the incongruity in (34c) as opposed to (34a) or (34b):

34a. Clyde went and won first prize in the raffle, the old goat!

b. Clyde went and won first prize in the raffle, the lucky bastard!

c. ??Clyde went and won first prize in the raffle - he's quite an expert at odds.

A similar incongruity is seen in (35) and (36):

35. ??It looked as if the crops were going to dry up completely, but fortunately it finally went and rained.

36. ??She's gone and ruined her dress now, the poor thing.

(36) is certainly possible, but probably only if the speaker is being sarcastic.

It is hardly necessary to mention the problems involved with the sentences of Type II. What is a plausible semantic representation for such a sentence? How is the semantic representation related to such a "conjoined" structure?

3.3. Perhaps the most obvious problem involved with sentences of Type III is that of relating them properly to paraphrases like the following:

37a. Henry sneakily told them he was spending a few days in the mountains to recuperate.

b. Henry was sneaky in that he told them he was spending a few days in the mountains to recuperate.

c. Henry did the sneaky thing of telling them he was spending a few days in the mountains to recuperate.

38a. Ernest was finally honestly saying he had lied to Oran.

b. Ernest was finally being honest in that he was saying he had lied to Oran.

c. Ernest was finally doing the honest thing of saying he had lied to Oran.

Type III sentences and paraphrases such as the above are to be distinguished from the superficially similar (39) and (40):

39. Henry was sneaky to tell them he was spending a few days in the mountains to recuperate.

40. Ernest was being honest to say he had lied to Oran.

That is, Type III sentences, and those I have designated as paraphrases, make two assertions, while (39) and (40) make only one. (14) and its paraphrases, for example, assert both that Henry told them he was spending a few days in the mountains to recuperate, and that he was sneaky to do so. (39), on the other hand, presupposes that Henry told them he was spending a few days in the mountains to recuperate, and asserts only that he was sneaky to do so. Cf. (41):

41. Henry wasn't sneaky to tell them he was spending a few days in the mountains to recuperate - he was just following well-established diplomatic procedure.

Unlike (14) and its paraphrases, (39) could not be used to inform an interlocutor that Henry told them he was spending a few days in the mountains to recuperate. The fact that this proposition is presupposed is reflected in the necessity of pronouncing (39) and (41) with reduced stress on the to-phrase (cf. Schmerling 1971).

The problem now is, if Type III sentences are indeed making two assertions, how are they to be distinguished from ordinary conjoined sentences? What seems to characterize a sentence like this is that the adjective in the first "conjunct" is predicated of the act expressed in the second; it does not express an inherent property of the subject of the sentence. A sentence like (4)

4. Aunt Hattie wants you to be nice and kiss your granny.

might thus be paraphrased as (42):

42. Aunt Hattie wants you to kiss your granny - it would be a nice thing to do.

Sentence (4) could perfectly well be addressed to a person who is not nice. It would not be interpreted as a request to the addressee to try to change his personality; it is simply a request to perform a particular act. Notice that if the addressee replied something like (43)

43. I'll be nice, but I won't kiss my granny.

he would probably get a spanking. On the other hand, a response like (45) to (44) might be taken as an indication that the speaker of (45) was obstinate, but not that he was a smart-aleck:

44. Make your bed, and put away your clothes.

45. I'll make my bed, but I won't put away my clothes.

The fact that the adjective in a sentence like this is predicated of the act expressed in the second "conjunct" explains why, in a Type III sentence, the adjective must be nonstative. Note the different properties of a superficially similar sentence like (46):

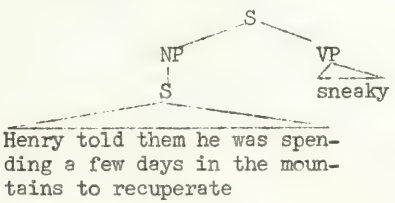
46. Betty is smart and speaks five languages.

A sentence like this is simply asserting two related things about Betty; it is not interpreted as saying that she is smart to the extent that she speaks five languages (but possibly stupid in other respects). Here the Coordinate Structure Constraint may not be violated:

47. *These are the languages that Betty is smart and speaks.

I have stated above that the adjectives in the first "conjuncts" of Type III sentences are predicated of acts expressed in the second, and such a statement might be taken as a suggestion that the underlying representation of, say, (14) be something like that schematized as (48):

48.



I do not believe this is correct, however, since Type III sentences and their paraphrases are possible only when the subject of what is here designated as the embedded S is human (or higher-animate). Cf. the examples in (49):

49a. *The train was sneaky and left five minutes early.

b. *The train sneakily left five minutes early.

c. *The train left five minutes early, and it was a sneaky thing to do.

(These are, of course, fine if the speaker is making a sarcastic, anthropomorphic reference to the train, which only proves my point.) That is, even though sentences like (50), which appear to have a sentential subject, are fully grammatical

50. Leaving five minutes early was a sneaky thing to do.

they are possible only if the speaker assumes that the subject of this sentence is higher-animate. This would seem to suggest that even in the underlying representation of, say, (14), Henry is the subject of sneaky. At any rate, we are faced with the problem of accounting for the fact that the class of adjectives found in Type III sentences (including nice, sneaky, honest, clever, smart, stupid, and many more) - adjectives which seem to display a systematic stative/non-stative ambiguity - occur only in sentences in which the (superficial) subject is a higher-animate NP or a sentence whose own subject is a higher-animate NP.[4]

At this point I have nothing to say about Types IV and IVa, except to point out that any adequate analysis of causatives should be able to handle them.

4. I have been assuming in all the discussion in this paper that the various types of sentences presented here are not to be represented as conjoined sentences in semantic representation. It might be objected, however, that (with the possible exception of Type II) the interpretations I have indicated for these sentences are, in fact, not their literal interpretations but inferences which can be drawn from them. Such a position would probably be adopted by Grice, for example, who has objected, in important unpublished work, to claims that English has "different

and's".[5] A Gricean approach to these sentences would claim that, for example, (16) asserts only Lizzie's actions of taking the axe and giving her mother forty whacks, and that the hearer of the sentence infers that Lizzie used the axe in doing the whacking. Grice would claim that (51) is evidence for this analysis:

51. Lizzie Borden took an axe and gave her mother forty whacks - although I don't necessarily mean to imply that she did the latter with the axe.

The Gricean approach, however, fails to account for the different syntactic properties such a sentence has with the instrumental interpretation, of the sort noted by Ross. Furthermore, it would claim that these sentences are vague between the "literal" interpretations and those suggested here. However, the so do-test indicates genuine ambiguity here. Thus, for example, sentence (24) would be possible

24. Spiro told a little joke and infuriated Paul.

both in a case where Spiro's joke-telling infuriated Paul and in a case where Spiro both told a joke and also infuriated Paul (by some unspecified means), and a sentence like (52) would be possible in four different situations

52. Spiro told a little joke and infuriated Paul, and so did Bob.

if these sentences were merely vague. This is not the case: (52) is possible only where the two comics infuriated Paul by telling a little joke or where they both told little jokes and infuriated Paul (by unspecified means).

This leads directly to my next objection to a Gricean analysis: the impossibility of using both in all these sentences with the interpretations under consideration. A Gricean analysis would have to explain this as being due to some ad hoc property of both. If these sentences are not derived from underlying conjoined sentences, on the other hand, the impossibility of both follows automatically from the Ross-Lakoff analysis of conjunction, since there is no AND preceding the first "conjunct" to be phonologically realized as both.[6]

Still another difference between sentences of the types

discussed here and true conjoined sentences is the form of the connective under negation: in the latter or appears, while in the former we still find and. The (a) sentences in each of the pairs below can only be interpreted as encoding true conjunction, whereas the (b) sentences have the interpretations we have been discussing:

53a. I didn't go to the store or buy the whisky.

b. I didn't go to the store and buy the whisky.

54a. For once she didn't go or ruin her dress.

b. For once she didn't go and ruin her dress.

55a. Don't be mean or tease Aunt Hattie.

b. Don't be mean and tease Aunt Hattie.

56a. Lizzie Borden didn't take an axe or give her mother forty whacks.

b. Lizzie Borden didn't take an axe and give her mother forty whacks.

57a. The occasion was remarkable in that Spiro didn't tell a little joke or infuriate Paul.

b. The occasion was remarkable in that Spiro didn't tell a little joke and infuriate Paul.

Thus, at the very least one is forced to recognize a "special" and for negative contexts.

Finally, a Gricean account of these sentences cannot explain the different characteristic intonation these sentences have from that in true conjoined sentences. More on this below.

5. Even though I have been unable to give anything approaching a satisfactory analysis of the sentences treated here, I have chosen to discuss them anyway because of a fascinating - to me the most intriguing - question they pose: why should there be so many sentences which "look like" coordinate structures but aren't? Surely something more is going on here than a perverse intent on the part of the language to baffle the poor linguist and make him think the Coordinate Structure Constraint won't work.

There has been much discussion in recent linguistic literature about conspiracies, most of them in phonology. A parti-

cularly striking example of a syntactic conspiracy is discussed in (Green 1970), but many others appear (albeit not discussed in such terms) throughout transformational work on syntax - cases where several underlying-structure types converge on one surface-structure type, or target structure. Is this what is happening here? The answer to this question would seem to depend on whether all these sentences have surface structures indistinguishable from those of true conjoined sentences.

The only evidence I can find which bears on this issue is that provided by intonation, which might be interpreted as indicating that the surface structures are distinct. Cases of true conjoined sentences are distinguished by a shift in pitch on the last word of the first conjunct, followed by a brief pause. The pitch may shift up or down, but it does not remain level. Many of the examples given in this paper, as written, could be pronounced with such an intonation, but then they could only be interpreted as true conjoined sentences. If the grammatical-as-written examples of NP movement are pronounced in this way, they are ungrammatical. The sentences of the types discussed here all show a level pitch on the last word of the first "conjunct", with no pause. (The pitch level may, of course, change before or after this word; the important thing is that the word itself is pronounced on a level pitch.)

The above observation is evidence for distinct surface structures, however, only if it is assumed that intonation contour is uniquely determined by surface structure - and there is considerable evidence against this position. The first sort of evidence against it to be noted by generative grammarians, to my knowledge, involved cases where intonation contours could not be assigned on the basis of the surface structures independently motivated syntactic rules led linguists to posit: such cases led Bierwisch (1966) and Chomsky and Halle (1968) to propose ad hoc readjustment rules which would have the effect of altering surface structure. Other cases have been adduced where it appears to be <u>impossible</u> to assign the correct intonation contour on the

basis of surface structure: a well-known example is the "comma intonation" of non-restrictive relative clauses, an intonation not shared by restrictive relatives. Presuppositions provide another problem for this position. In sentence (58)

58. I didn't know John was here.

if the speaker assumes that the addressee knows that John was here he will pronounce John was here on a low monotone, and the falling intonation characteristic of declarative sentences will come after know; if he assumes that the addressee does not know this, he will not pronounce the complement S on a monotone, and the falling intonation is after John (see Schmerling 1971). Once again, there seems to be no way of assigning the correct intonation contour on the basis of surface structure alone.

The obvious conclusion to be drawn from these observations is that intonation contours cannot necessarily provide evidence for surface structure. Perhaps some types of intonation information can - but this remains to be demonstrated, to the best of my knowledge.

What, then, of our conspiracy? What I want to claim is that the rules applying in the derivations of these sentences "conspire" in a more fundamental way than by producing identical surface structures. What these rules produce might be considered canonical surface structures, or canonical strings. By canonical strings I mean strings (such as the "conjuncts" in the various examples here) which "look like" strings involving a minimal amount of derivation (i.e. involving a minimal number of rules relating surface form and semantic representation).[7]

If we look at the various examples in this paper, we note that the different "conjuncts" are strings of quite simple form: NP-V, NP-V-NP, NP-be-Adj. "Derived" categories such as prepositions and adverbs in -ly are notable for their absence. Special "grammatical morphemes" are eschewed in favor of independently-occurring lexical items. Type II is an especially striking example of this: instead of a special morpheme to indicate scorn we find the independently-occurring go (clearly the same lexeme -

note the same suppletive variants) even though no motion is necessarily involved in these cases.

The various sentence types discussed in this paper share an important feature: they are typical of colloquial speech. Paraphrases with surface strings deviating from the canonical types are invariably felt to be more complex somehow. The Type III cases, for example, can be paraphrased using adverbial forms, and the Type IV cases can be paraphrased with _with_-phrases, yet speakers agree that these paraphrases are more "complicated". The "complication" is obviously not one of length: in most cases the less "complicated" variant is actually longer. Rather, the "complication" seems to involve greater use of derived categories. It would appear then that the sentences discussed here illustrate a preference for canonical surface forms: the rules applying in the derivation of these sentences seem to "conspire" not so much to achieve a certain target structure but to avoid the creation of derived categories.

## FOOTNOTES

*This is a greatly expanded version of part of a paper written for a course taught by Herbert Stahlke, whom I wish to thank for much helpful discussion. I am also grateful to Georgia Green for suggesting several stylistic improvements. All absurdities are of course my own.

[1]Similar sentences exist with _take and_ and _up and_. I have limited my discussion to _go and_-examples, however, since only these are well-established in my idiolect.

[2]This is, of course, grammatical if _Paul_ is understood as the indirect object of _told_ but not with the interpretation under consideration here.

[3]There are, of course, sentences with _to_-phrases which make two assertions, such as _I came home (only) to find the apartment ransacked_ - obviously not involving purpose.

[4]More specifically, the subject must be an agent. Thus the problem of the correct semantic representations for sentences such as these is intimately connected with the problem of the correct representation of the notion "agent".

[5]I do not wish to be unfair to Grice, and it may be that I am in fact setting up a straw man here. Nevertheless I feel that the sort of analysis I am arguing against is initially quite attractive and therefore worthy of discussion.

[6]This analysis is discussed in (Ross 1967, Chapter IV).

[7]I am using the term derivation in a rather loose sense to refer to the relating of semantic and surface representations, and by derived categories I mean categories needed in the latter and not in the former. The claims I am making here are independent of claims concerning the existence of an intermediate level of deep structure.

I am doubtless using the term canonical in a fairly original sense, but I haven't been able to come up with something better.

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# ASPECTS OF NEGATION IN CLASSICAL GREEK

by

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Negation in classical Greek has traditionally been assumed to be, as we might expect from the post-neogrammarian approach to syntax, a surface structure phenomenon, although it has long been recognized that the semantic component is in several instances responsible for the pattern of negation. In these latter cases the received interpretation is similar, though naively so, to a generative analysis, but since the syntax of the classical languages is often little more than classification--again based on the surface structure--with no integrated theory or methodology underlying that classification, the resulting description is anything but coherent. In what follows I would like to formalize some obvious and some not so obvious aspects of negation in Greek from both a syntactic and semantic point of view.

In point of fact negation in Greek is determined neither by the surface nor by the deep structure but rather by the intermediate structure.[1] I assume, as most Greek grammarians do, that the basic negative, the negative of the simple deep structure, is ou; the surface structure, however, contains both ou and mê. This means accordingly that in the process of generating sentences Greek converts ou to mê, though only under rather well-defined circumstances.[2] Let me exemplify.

Consider the following sentences.

(1) the man does not marry i.e. is not married
(2) the man does not have evils

In each case the negative is ou in Greek. These sentences can be combined in a number of ways without affecting the negative, but when (1) is subordinate to (2) in the form of a conditional clause, negative conversion (ou→mê) occurs obligatorily in the if-clause, producing

(3) if the man does not marry, he (the man) does not have evils

with the negative mê occurring in what is now the protasis and ou remaining in the apodosis or main clause. Stated in purely descriptive and traditional terms the negative of conditional clauses is mê, but it is clear, I hope, that the presence of mê must be accounted for by an obligatory negative conversion rule.[3]

Furthermore, the presence of an equi-NP in Greek is almost always the immediate catalyst for further structural change of one sort or another.[4] In (3) the presence of an equi-NP may subsequently induce one of two possible changes, producing either a relative clause or a participial construction.

(4) the man who does not marry does not have evils
(5) the man not marrying does not have evils

Regardless of which optional transformation is chosen, the process of negation is identical in both (4) and (5); mê negates the clause which has undergone the structural change, while the main clause, unchanged from the outset of the derivation, retains ou. Since Greek tends for the most part in sentences like this to use the participle,[5] sentence (5) is precisely what we get in Menander's

ho mê gamôn anthrôpos ouk ekhei kaka
the not marrying man not has evils.[6]

The negative mê is therefore predicated on a context sensitive rule which converts ou to mê. In (4) and (5) the presence of mê is determined solely by the underlying conditional in (3), just as the semantic interpretation derives from (3). If the intermediate structure does not contain a conditional or some other string requiring

negative conversion, as in the derivation of merely descriptive relatives and participles, then the deep structure negative ou is retained. Traditional Greek grammars imply that the state of affairs outlined here obtains in sentences of this type but of course do not explicitly describe the sentences in this way, because to state that the particular negative and likewise the semantics of the construction are determined by an actual conditional in the "history" of the sentence is simply beyond the scope of even the footnotes in our received grammars.

A similar analysis can and must be extended to other structures where the presence of mê is also determined by the intermediate stages of the derivation but which are treated haphazardly, if at all, by our school and descriptive grammars. We read in Plato's Phaedo (58B): "As soon as the mission has begun, then, it is their law to keep the city pure during that time, and to put no one to death before the ship arrives at Delos and comes back again here; this often takes some time, when the winds happen to delay them."[7] Notice "it is their law ...to put no one to death," which is in the Greek: nomos estin autois ...mêdena apoktinnunai, with the negative mê.[8] In accordance with the approach suggested above, negative conversion has taken place at some point in the intermediate structure before this particular string was nominalized and embedded in the higher sentence. The intermediate stage of the derivation which we are seeking is not difficult to find; the law in effect stated, "Do not kill anyone," and this is a negative command or prohibition which, like conditional clauses, requires the negative mê. It is the negative command in the underlying structure which is responsible for the negative, and subsequent transformations do not alter the mê. The precise form of the law--and law it seems to have been, since Xenophon Mem IV, 8, 2 refers to it--we do not know, but there are only two possibilities in Greek: mê plus either an imperative or a subjunctive.[9] This then is another example in which it is obvious that the surface structure does not determine the choice of negative.

It is not so obvious, however, that the deep structure is not involved, since the negative command or prohibition is considered to be

an "independent" subjunctive. It is here that the traditional philological account is especially at odds not only with modern linguistics but also with ancient grammar. The subjunctive (or optative for that matter) independent syntactically and semantically does not exist in the deep structure, and its presence in the surface structure is to be explained in the same way that any other oblique mood usage is explained, i.e. by complementation. Mood--at least in Greek and Latin--is a complementizer, does not mean anything at all per se, and appears in a sentence only by virtue of a transformational process.[10] The deep structure contains an abstract verb which requires a complement sentence with its V in an oblique mood. There is no need here for an extended discussion of abstract syntax, since Robin Lakoff has devoted a considerable amount of attention to the role played by abstract verbs in Latin complementation, and I am content merely to refer to her discussion.[11] I am therefore postulating an abstract verb for the deep structure of the Greek sentence in question and for those other Greek sentences which have been claimed to exemplify an independent usage of the subjunctive. To quote Dr. Lakoff: "In this way, all the properties of these independent constructions, which must be treated separately by the philologist, are accounted for by postulating verbs present in the deep structure but absent in the surface structure, verbs whose syntactic properties correspond to those of real verbs of the same meaning-class," and furthermore "What is present in the deep structure is a verb with semantic and syntactic properties similar to those found in real verbs but with no phonological form; such verbs govern the application of complemetizer-placement, complementizer-change, and sometimes other rules as well."[12] Ultimately this verb is obligatorily deleted; the negative command or prohibition is an intermediate structure governing negative conversion, not an "independent" subjunctive.

Interestingly the subjunctive was never considered independent by the ancients themselves, as the etymology of 'subjunctive' may well indicate. "The name subjunctive is due to the belief of the ancient grammarians that the mood was always subordinate."[13] Diomedes states that the mood is so named, because in and of itself it does not

express meaning (quod per se non exprimat sensum), and Priscian states that the subjunctive needs among other things another verb in order to express its full meaning ( ...altero verbo, ut perfectum significet sensum).[14] In sum then the concept of an abstract verb is not at all antithetical to the study of the classical languages, and as we shall see later, there are structures in Greek which simply cannot be explained except on the basis of an abstract verb in the deep structure.

Another example may suffice to exemplify further the combination of negation and abstract verbs. When a speaker asks what he is to do or say in a given situation, he uses the subjunctive (e.g. ti draso? what am I to do?). The construction is termed the deliberative subjunctive or, alternatively, a question of appeal and is negated by mê. Often, however, the question is preceded by a verb form, e.g. boulei (do you wish), but of course the presence of boulei is optional.[15] The omission or deletion is traditionally considered ellipse, but it provides an apposite parallel to what we term abstract syntax. Briefly, boulei is the verb of the higher sentence in the deep structure, requires the complementizer subjunctive mood, governs negative conversion in its complement sentence, and may then be optionally deleted. Precisely the same procedure is followed by abstract verbs with but one significant difference--the deletion rule is obligatory.

To recapitulate: I have argued that only one negative, ou, is present in the deep structure of classical Greek, that under certain, specific well-governed syntactic conditions this negative is converted to mê which remains regardless of subsequent transformations and which will therefore appear in the surface structure, that abstract syntax is a sine qua non of any adequate description of Greek grammar, and that abstract syntax is intimately related to the pattern of negation since it is the abstract verbal complex which governs negative conversion in those structures which are traditionally termed independent subjunctives and which are negated on the surface by mê. There are, however, other negative structures which appear to behave aberrantly or at best idiosyncratically, and in what follows I shall attempt to show that this behavior is, on the contrary, not at all odd

and that these structures provide additional proof for negative conversion and abstract syntax as well.

Inherently negative verbs have long been recognized for what they are by the classical grammatical tradition; e.g. every grammar provides separate treatment for many of these verbs under 'hindering' or some other semantically equivalent rubric. The classification of inherently negative verbs, although sophisticated in many respects, misses at least one very important generalization. Consider the following sentences:[16]

(6) a) eirgei se mê graphein
b) eirgei se graphein
c) eirgei se to mê graphein
d) eirgei se to graphein
e) eirgei se tou mê graphein
f) eirgei se tou graphein

( ) (7) a) ouk eirgei se graphein
b) ouk eirgei se mê ou graphein
c) ouk eirgei se to mê graphein
d) ouk eigei se to mê ou graphein

All forms of (6) mean "he prevents you from writing," and all forms of (7) mean "he does not prevent you from writing."[17] The variety of constructions may not completely boggle the mind, but it does engender a certain amount of confusion; nevertheless the salient characteristics of the surface structures can be found in almost any grammar of Greek. With regard to the negatives in the lower sentence, it can be seen at a glance that 1) no negative is obligatory, 2) mê may accompany the complement, and 3) if the higher S is itself negated and if the lower S has mê, then ou also usually occurs in the lower S, although as (7c) proves, it need not occur. Therefore, the embedded complement sentence may contain no negative, the negative mê, or both mê and ou. These negatives are termed "redundant" or "sympathetic" and "confirm" the negative idea (i.e. the inherent negation) in the

leading verb.

Such a description omits the observation that the complement sentence can not itself be negated. Quite simply then, verbs of this class do not admit a negatived complement, and this is a fact of the native speakers' innate competence, not merely of their subjective Sprachgefühl. It is for this reason that, regardless of the presence or the absence of negative(s) in the complement sentence, semantic ambiguity could not arise under any circumstances in this environment.

What I have added to the traditional analysis of these verbs is simply the crucial generalization which accounts for the variation in the surface structure and yet also for the stability in the deep structure or meaning and which relates the speakers' performance to their competence. Yet it is not clear on the one hand what allows this negative pattern to exist in the first place and on the other hand how it is involved in the process of negative conversion, and these are questions which deserve answers. The point of departure is in my opinion to be found in a recent treatment of inherent negators in Latin: It has been suggested that certain complementizers in Latin "contained in them the negatives that these verbs [sc. inherently negative verbs] have as part of their meaning."[18] This suggestion is, I believe, correct.

In Greek the complementizer in sentences of the type under consideration is the accusative-infinitive; therefore negative-attachment is ruled out, and if the inherent negation of the negative-meaning verb is to be represented in any fashion in the surface structure, it must be realized in the form of an actual negative. I suggest then that the presence of μή (optional as was indicated above) in complements after negative-meaning verbs of the class of verbs of preventing in Greek is parallel to the presence of a negative element attached to the complementizer in Latin in sentences of this kind. The μή is therefore, according to this interpretation, simply the segmental representation of the negative element of the inherently negative verb. In short, the traditional assumption that μή confirms or affirms the negative idea of the main verb is seen to be eminently sound and entirely correct,

but it requires the more extensive theoretical point of view of generative grammar and an analysis such as the one presented here in order to interrelate the syntax and semantics of the negative patterns found in structures containing inherently negative verbs.

Of the questions posed above, however, only the first has been answered, and that only partially; μή is accounted for, but the οὐ which usually follows that μή after a doubly negated (οὐ + inherently negative verb) higher sentence still remains as a "sympathetic" negative, and this is only minimally adequate unless it can be shown that the pattern corresponds to negative patterns elsewhere in the language. I therefore propose to consider μὴ οὐ here as a quasi-compound, since οὐ, if present, obligatorily accompanies μή and cannot appear without it in this environment. As a compound negative following the simple negative of the higher S it is only natural, even apart from the fact that the lower sentence cannot be negated, that the μὴ οὐ does not affect the meaning of the sentence inasmuch as it is no different from any other compound negative.[19] My proposal then relates the negative pattern here to the normal syntactic and semantic behavior of negatives elsewhere, for negative reinforcement is a commonplace in Greek. The key to understanding the behavior of negatives after verbs of "hindering" is the generalization, consistently overlooked by the traditional grammars, which notes that these verbs do not tolerate negation of their complements. Without this, it seems that we must be content with a description, and a not very good one at that, of the surface structure.

According to my earlier argument μή occurs in the surface structure only after a negative conversion rule of the type οὐ→μή had been applied. In the environment under discussion it is clear that the lexical feature "inherently negative" is the context which triggers the negative conversion rule, but the origin of the οὐ in the deep structure which is converted to μή as a result of the lexical marking of that verb is not to be found in any of the assumptions of traditional grammar. That οὐ is the negative of the abstract IS NOT SO which underlies verbs of preventing and so forth and which is the negative-

meaning element in the deep structure of inherently negative verbs,[20] and Greek, unlike some other languages, allows optionally for the representation of that negative in its surface as well as its deep structure. In view of this analysis it is almost otiose to note that the deep structures of Greek and English and Latin are very similar indeed.

The mê ou pattern operates in other related structures but in a different manner. Certain verbal constructions consist of a verb plus a negative--either ou or the alpha-privative ( a bound morpheme in word-formation which negates or counters, e.g. dunatos "possible" but adunatos "impossible"). These expressions are virtually equivalent semantically to non-negated inherent negators and are treated together with negative-meaning verbs in our grammars. They are of a different class, however, because their complements may be negated. In this mê ou construction the mê is considered the real negative and ou is again termed redundant or sympathetic. It should be clear by now that this is an incorrect statement of the syntactic and semantic facts. The mê here is the same mê, the (converted) negative element of the deep structure, which follows real inherently negative verbs, and the ou negates the complement. In other words the sympathetic ou is a figment of the received grammatical tradition and is not a viable and operable grammatical entity. Again, a closer analysis of the sentence types reveals a consistent pattern of negation. Mê ou behaves strictly in accordance with the lexical and grammatical features which mark the verb of its higher sentence, and it is the admissibility or inadmissibility of negation in the lower sentence which determines the precise manner in which mê ou is to be construed. The verbs or verbal expressions are of the same general class, as witness the presence and function of mê in an identical fashion in all the instances examined, but within that general class they are subcategorized differently, as witness the semantic variation with regard to ou.[21]

One other class of verbs behaves in a manner so similar to those verbs we have been discussing that it would be remiss not to take them into consideration, although it is necessary to point out at the outset

that verbs of fearing have never been classed with verbs of negative meaning by classical philologists. Nevertheless the surface structure of fearing expressions manifests sufficient a priori evidence to do so.

8) phoboumai mê tauta genêtai — I fear this will happen
9) phoboumai mê ou tauta genêtai — I fear this won't happen

We recognize here the same pattern of negation found after those verbal expressions which are virtual inherent negators and which admit negation in the complement sentence.[22] Here, however, the complementizer is the oblique mood, either subjunctive or optative depending on sequence, not the accusative-infinitive/infinitive as in the previous instances, but the presence and function of mê after verbs of fearing cannot be distinguished from its presence and function in those other sentences. They should therefore be considered a negative-meaning verbal expression of some sort, since the mê is surely the negative element of the deep structure, and ou is the negative which negates the complement. I suggest that the verb of fearing is a real rather than a virtual inherently negative verb[23] which differs from verbs of hindering in that it allows negation in its complement; in any case the pattern of negation forces us to consider verbs of fearing as members of that general class of verbs which are negative-meaning.

Once we have noticed that one sub-group of negative-meaning expressions tolerates negation in its complement and that verbs of fearing are of this type, we may then posit for classical Greek an abstract inherently negative verb and in that way account for the structure of that "independent" subjunctive termed variously a cautious or modest or doubtful assertion. The construction is apparently not inherited since it appears first in Herodotus and most frequently in Plato;[24] it consists of mê + subjunctive for a positive statement and mê ou for a negative one:

10) mê tauta genêtai — (I suspect) this may happen
11) mê ou tauta genêtai — (I suspect) this may not happen

The same pattern of negation operates here[25] as in the previously discussed structures, and this is the clearest example in either Greek or Latin of both the validity and the necessity of abstract verbs in grammatical analysis. Every syntactic and semantic feature of sentences (10) and (11) --the mood, the negative(s), the meaning -- can be described, but only if an abstract verb is postulated as the higher sentence and only if that abstract verb is inherently negative in the same manner as verbs of fearing. No other structure so clearly exemplifies the close relationship between negation, inherent or otherwise, and the deep structure, abstract or otherwise.

To conclude this discussion it is necessary only to reiterate the several conclusions reached at various stages of the separate analyses, and this I shall forego. Our traditional grammars have obscured or omitted many significant features of negation patterns in classical Greek, and these inadequate descriptions must be improved. I have tried to show how I think this improvement may be attained; from my discussion it is clear that syntactic as well as semantic factors are extensively involved, and of these factors some are thoroughly embedded in the traditional approach to grammar, while others are derived from concepts totally unfamiliar to philology. It seems to me that the analysis presented here is superior at least to the traditional ones which are couched in non-linguistic terms; cf. eg. Smyth's statement: "The simple negative particles are ou and mê. Ou is the negative of fact and statement, and contradicts or denies; mê is the negative of the will and thought, and rejects or deprecates" [italics his].[26] Whatever form a complete and total description of negative patterns may ultimately take is still a matter of doubt, but I am confident that among other features it will include a negative conversion rule, a formal description of abstract syntax at least insofar as it is applicable, and an in-depth discussion of inherently negative verbs which subcategorizes those verbs into two classes on the basis of the behavior of the negative in their complements.

## NOTES AND REFERENCES

[1]In general, cf. the situation with regard to concord, which has usually been considered a surface structure phenomenon, as discussed and revised by George Lakoff, "Global Rules," Lg. 46 (1970) 627-639, especially 628-9.

[2]I say and mean well-defined, even though a cursory glance at almost any Greek grammar might seem to belie my assertion; this, of course, only proves that negation in Greek poses serious problems for linguists and philologists alike.

[3]This is the normative statement; cf. e.g. W.W. Goodwin, Syntax of the Moods and Tenses of the Greek Verb (Boston 1893) 138: "The negative particle of the protasis is regularly μή, that of the apodosis is οὐ." But οὐ does occur in protases, and this variation has engendered much debate, to say the least. For a review--though of a curiously personal nature--of scholarly opinions on μή and οὐ in protases, see B. Th. Koppers, Negative Conditional Sentences (The Hague, n.d.) 34-38. Koppers' analysis of these negative patterns sounds hollow at best. She started "from the knowledge that Greek οὐ does not mean the same as μή" and "found that the use of the different negations can only be explained psychologically not formally" (both quotes from p. 13). Her knowledge and psychological insight are, evidently, nothing short of amazing, but it is her conclusion which is particularly disturbing; at the end of her survey of the various opinions on the problem (p. 13) she maintains that "there seems to be no need to underline that the difference has nothing to do with the structure of the sentence." In spite of statements such as these it is altogether clear that the normal negative of the protasis was regularly μή, and perhaps the most telling evidence in favor of this conclusion is Plato's striking ellipse at Meno 80 C: εἰ δὲ μή, οὐ ("but if not, not").

[4]For example, equi-NP-deletion is a commonplace in accusative-infinitive (roughly for-to) complementation and is in addition

accompanied by obligatory concord readjustments under certain circumstances, and there are numerous other types of sentences whose surface structures either imply or prove the presence of coreferential noun phrases in the underlying structure.

[5]Greek, unlike Latin, has a full set of participles available for use in a variety of structures. In addition to the relative and participle, the protasis of (3) could also be rendered by a temporal clause with, of course, the negative mê.

[6]I should point out that the negative which I am rendering ou actually consists of three variants: ou, ouk, and oukh; the conditioning is phonological: ouk/__V, ou/__C$^{=}$, oukh/__C$^{h}$.

[7]The translation is that of W.H.D. Rouse, Great Dialogues of Plato (New York: Mentor paperback, 1956) 460-61.

[8]In addition to its simple negatives ou and mê Greek has a series of compound negatives which consist of the simple negative plus some other word, e.g. oupote and mêpote "never" and oudeis and mêdeis "no one." In the Greek quotation mêdena is a compound negative (accusative case). The compound negatives are used in precisely the same environments as their corresponding simple negatives, and whatever syntactic and semantic features accrue to the simple negatives adhere to their compounds also. When they occur together in the same clause, word order becomes important, and a compound negative following a simple negative only reinforces the original negation, whereas when the word order is reversed and the simple negative follows the compound, then each retains its own negative force.

[9]The rule is somewhat more specific, and the choice between subjunctive or imperative is predicated on an aspectual distinction. Excluding the first person where there can be no choice (traditional grammars seem not to understand why there are no first person imperatives), the choice is between progressive imperative or aoristic subjunctive but not vice-versa, although there are rare exceptions. The law could

therefore have been stated in any of several ways, but since my concern is with the subjunctive, the imperative need not detain us. In either case the negative is always $\widehat{\text{me}}$.

[10]Needless to say, this statement is directly at odds with traditional philology, but then so is this entire discussion.

[11]Robin T. Lakoff, Abstract Syntax and Latin Complementation (Cambridge, Mass. 1968) 157-217. All subsequent references to Lakoff are to this monograph.

[12]Lakoff, op. cit., 160 and 161 respectively. For the theoretical significance of Mrs. Lakoff's proposals, see the review by Georgia M. Green, Lg 46 (1970) 149-167. Cf. also the review by Fred W. Householder, Language Sciences, No. 6, August, 1969, pp. 11-18; then cf. further Robin T. Lakoff, "More on Abstract Syntax," Language Sciences, No. 10, April, 1970, pp. 30-35 and Fred W. Householder, "Reviewer's Reply," ibid., pp. 35-6. For the judgement of one of this country's most distinguished Latinists on Dr. Lakoff's contribution to Latin grammatical studies, see the review by Maurice P. Cunningham, Classical Philology 65 (1970) 273-77.

[13]H. W. Smyth, Greek Grammar, revised by G. M. Messing (Cambridge, Mass. 1956) 403.

[14]Diomedes and Priscian are Latin grammarians of the late 4$^{th}$ and late 5$^{th}$/early 6$^{th}$ centuries respectively, and their statements are quoted from H. Keil, Grammatici Latini (Leipzig, 1855-1932, 8 vol.) vol. I, p. 340 and vol. II, p. 424 respectively. The context in Priscian makes it abundantly clear that verbo must be rendered by "verb." There are a considerable number of statements of a similar nature scattered throughout the Greek and Latin grammarians in whose works the general phenomenon of ellipse played a considerable theoretical and pragmatic role. See e.g. the R. Schneider and G. Uhlig edition of Apollonius Dyscolus (Leipzig, 1902-1910, 3 vol.) vol. 3, pp. 93-94, for some parallels. In dealing with concepts such as these in the ancient

grammatical treatises, it is never superfluous to note that the concepts were not necessarily applied in a systematic fashion, and this methodological caveat is a not unimportant distinction. Inasmuch as I am in a position to speak with a certain amount of authority on the subject of the ancient Greek and Latin grammarians, I feel constrained to note that several, perhaps many, of the claims made by modern linguists under the guise of Quellenforschung are unfortunately sometimes extravagant and excessive and should in many instances be considered merely as tentative suggestions, though I would hasten to add that most of these suggestions as I have termed them are uniformly interesting and some fundamentally correct. For one such sober statement, see the review of Lakoff by G. M. Green (op. cit., above, n.12) p. 156, and for several perceptive observations, see the review of Lakoff by M. P. Cunningham (op. cit., above, n.12). See also Luigi Romeo and Gaio E. Tiberio, "Historiography of Linguistics and Rome's Scholarship," Language Sciences, No. 17, October, 1971, pp. 23-44.

[15]On this point see e.g. E. S. Thompson's note to Plato Meno 75 A in his edition of the Meno (Cambridge, 1901).

[16]Sentences (6) and (7) are adapted from Smyth, op. cit., pp. 623-4.

[17]In sentences (6) and (7) the higher sentences are eirgei and ouk eirgei respectively, and everything following eirgei is in each instance the complement sentence.

[18]Lakoff, p. 135.

[19]Cf. n.8 above. As the occurrence, even though optional, of the articles to and tou proves, the complementation process after verbs of preventing differs from the normal procedure, and were it not for this difference, my suggestion would be even more tentative than it is.

[20]I make this point separate and distinct from my earlier argument that the mê is the negative-meaning element only because a tree-diagram

representing (6) as something like "he causes it that you write it is not so" is so far removed conceptually from the traditional philological account.

[21]For a discussion of these constructions which is somewhat more enlightened than the customary account, see A. C. Moorhouse, "The Construction with ΜΗ ΟΥ," Classical Quarterly 34 (1940) 70-77. Moorhouse arrives at the same classification as I do, but this is not at all surprising since the two classes are kept distinct in all grammars. Needless to say, he does not hit upon the crucial generalization which I have insisted upon and which is the one syntactic and semantic characteristic which verifies the validity of establishing the two classes of verbs. There are, as one might expect from the date of Moorhouse's article, considerable differences between our analyses of the μὴ οὐ. Moorhouse (p. 72) believes that after doubly negated verbs "the function of οὐκ in μὴ οὐκ is to cancel the μή." I confess that at an earlier stage in my study of these structures I too, though unaware of Moorhouse's conclusion, adhered to this explanation. This position, however, is not tenable, because Greek negatives do not cancel one another. We are compelled to retract the theory of cancellation, for it requires suspending or transgressing an otherwise comprehensive rule of the language. As a strictly ad hoc solution, it may have some pseudo-value pedagogically, but if applicable anywhere, it is applicable in Latin rather than in Greek and in a slightly different context. For those who may be interested in some of the ramifications of the application of generative grammar to the teaching of the Greek and Latin languages, I discuss these, in a context dealing with some of the specific structures under discussion here, in an article entitled "Mures, immo homines: Rationalism in Language Learning," forthcoming in Classical Outlook. We can with justification dismiss cancellation as an answer to the problem at hand; yet we should probably consider it, though incorrect, as a step in the right direction. Moorhouse is himself aware that his position cannot be maintained in the structures

following what I have termed virtual inherent negators and for all practical purposes gives up in despair when he states (p. 73) that "μὴ οὐ here is simply an illogical copy of the use of μὴ οὐ after verbs of class (I), verbs of denying, preventing, etc." This statement is in manifest violation of the facts, and it is with more confidence than might be normally expected that I offer my own solution to the use of μὴ οὐ in the complements after the two classes of negative-meaning verbs and verbal expressions.

[22]The examples are again adapted from Smyth, p. 501. There are two explanations of constructions involving verbs of fearing in Greek (and Latin also) which may be called traditional, but neither merits serious consideration. The first states that μὴ is not a negative but is a conjunction meaning "that" or lest;" confusion begets confusion. The second analyzes the sentence as consisting of two independent entities which are then paratactically conjoined; neither of these entities exists elsewhere in the language, of course, and this explanation derives directly from the assumption of a verifiable "me Tarzan you Jane" stage in diachronic syntax.

[23]The distinction may not be necessary except insofar as the neogrammarian habit of attaching labels to grammatical constructions is concerned. The important distinction is that verbs of fearing tolerate negation in their complements; this, of course, is a characteristic which they do not share with real inherent negators such as verbs of preventing. On the other hand their inherently negative meaning, as evidenced by the negation pattern, is not dependent on a negative morpheme, as is the case with virtual inherent negators. The choice in classifying therefore seems determined by the system of classification and not essential to an understanding of the structural description.

[24]Goodwin, op cit., p. 92.

[25]These examples are mine. The negative construction here is usually compared, correctly, to that with verbs of fearing, but the negative

and subjunctive construction as a whole is, unfortunately, treated separately.

[26]Smyth, p. 608. I certainly do not intend to pick on Smyth to the exclusion of other Greek grammars; Smyth's grammar is probably the most widely used one in the country, and for that reason, one of convenience, I have tried wherever possible to confine my references to his rather than to some other grammar.

# A SELECTED BIBLIOGRAPHY OF SEMANTICS-BASED GENERATIVE GRAMMAR

Having been 'commissioned' to prepare a bibliography of Generative Semantics, we soon discovered that what we called 'Generative Semantics' was in reality at least seven or eight different things with, in many cases, little or no overlap. In the broadest sense, 'Generative Semantics' refers to the assumption that semantic representation provides the input to the transformational rules of a grammar, an idea which was unthinkably radical when Jeffrey Gruber proposed it in his 1965 MIT dissertation, but which now is taken almost for granted by many. However, only a relatively small part of the literature is concerned with elaborating and explicitly motivating this assumption. In another sense, the term 'Generative Semantics' is taken to refer to a theory in which global rules and other derivational constraints play a major role--although as G. Lakoff argued in "Global Rules", this theory is logically quite independent of the role of semantics in a grammar. In still a third sense, 'Generative Semantics' is used to refer to what was for a time called 'abstract syntax', which is not so much a theory or an assumption as a way of doing things: showing how the apparently arbitrary distributions of grammatical constructions and relationships were predictable if one postulated underlying structures that were somewhat more 'abstract' than the surface structures they represented. The abstractness of these structures resided primarily in their containing elements which might not show up in surface structure and category labels that differed from those borne in surface structure, and in their expressing grammatical relationships which did not hold at surface structure. None of these characteristics was by itself a theoretical innovation; yet they resulted in a conception of deep structure that differed appreciably from that of Aspects. Ross' "On declarative sentences", his "Auxiliaries as main verbs', and R. Lakoff's Abstract syntax and Latin complementation are paradigm examples in this tradition.

Clustered around these three concepts, and yet not belonging more to any one than to any other are 1) proposals concerning the representation of reference, definiteness, and quantifiers in underlying structure, 2) attempts to describe the way(s) in which presuppositions, assumptions, and entailments seem to govern various grammatical phenomena, 3) discussions of various phenomena involving expressed and implied negation, 4) proposals concerning lexical structure, lexical insertion in a grammar with a semantic base, and the representation of the meaning of specific lexical items and classes of lexical items, and 5) demonstrations of the relevance of diverse kinds of semantic facts to grammatical and even phonological phenomena. Consequently the bibliography consists of eight sections reflecting these focuses of research. Naturally there are many papers which bear on several issues, and some which only arbitrarily can be put in one of these categories. For the latter, alternative classifications have been given at the end of the entries.

A few words of caution: 1) this bibliography is not exhaustive--it probably could not have been. Case theory for instance has been all but ignored except for work by Fillmore, its main articulator. Many relevant works have no doubt been inadvertently left out, and for this we apologize to their authors, and perhaps more important, to the reader. With the exception of Donnellan's "Reference and definite descriptions" (which was included because it describes an important class of data which linguistic thoeries purporting to deal with reference have yet to deal with in a natural way), no articles by philosophers have been included. For a suggestive bibliography of philosophical viewpoints on linguistic problems, the reader is referred to "Bibliography: Logic and Language" prepared by B. Partee, S. Sabsay and J. Soper, mimeographed and distributed by the Indiana University Linguistics Club. 2) The authors of some of the papers included here would not consider their work 'generative semantics'; most of these papers have been included because they bear on phenomena or issues crucial to 'generative semanticists'' claims.

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## ABBREVIATIONS

BaH Bach, Emmon, and Robert T. Harms, eds. Universals in linguistic theory. New York, Holt, Rinehart, and Winston. 1968

BiH Bierwisch, Manfred, and Karl Erich Heidolph, eds. Recent advances in linguistics. The Hague, Mouton. 1970.

DH Davidson, Donald, and Gilbert Harman, eds. Semantics of natural language. Dordrecht, Netherlands, D. Reidel. 1971.

FL Foundations of language.

GUMSLL Georgetown University. Monograph series on languages and linguistics.

HCL Harvard University Computation Laboratory.

HRK Kachru, Braj B., et al., eds. Papers in linguistics in honor of Henry and Renée Kahane. Urbana, Illinois, University of Illinois Press.

JPL Journal of philosophical linguistics, ed. by William Todd. Vol. 1, no. 1 appeared as Studies in philosophical linguistics, series one. Evanston, Illinois, Great Expectations Press. 1969-.

JR Jacobs, Roderick A., and P.S. Rosenbaum. Readings in English transformational grammar. Boston, Ginn-Blaisdell. 1970.

IULL Indiana University Linguistics Club.

JL Journal of linguistics.

Lg. Language.

PIL Papers in linguistics.

RBL Sadock, J.M. and A. Vanek, eds. Studies presented to Robert B. Lees by his students. Edmonton, Linguistic Research. 1970.

RS Reibel, David A., and Sanford A. Schane, eds. Modern Studies in English. Englewood Cliffs, N.J., Prentice-Hall. 1969.

RT Rosenberg, Jay F., and Charles Travis, eds. Readings in the philosophy of language. Englewood Cliffs, N.J., Prentice-Hall. 1971.

SILS Studies in the linguistic sciences, (working papers), Department of Linguistics, University of Illinois, Urbana, Illinois.

SJ Steinberg, Danny and Leon Jakobovits, eds. Semantics: an interdisciplinary reader in philosophy, linguistics, and psychology. Cambridge University Press. 1971.

SLS Fillmore, Charles J., and D. Terence Langendoen, eds. Studies in linguistic semantics. New York. Holt, Rinehart and Winston. 1971.

SSS Kiefer, Ferenc, ed. Studies in syntax and semantics. Dordrecht, D. Reidel. 1970.

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McCawley, James D. 1967. The annotated respective. Duplicated, University of Chicago.

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1968. The role of semantics in a grammar. BaH 124-169.

1970. Syntactic and logical arguments for semantic structures. Duplicated, University of Chicago. To appear in a volume of proceedings of the 5th International Seminar on Theoretical Linguistics, to be published by the TEC Corp., Tokyo. (DRQ, L).

1971. Interpretive semantics meets Frankenstein. FL 7:285-296. [Refutes claims made by Katz in 'Generative semantics vs. interpretive semantics'. FL 6:220-259].

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## ABSTRACT SYNTAX (AS)

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Bach, E. 1968. Nouns and noun phrases. BaH 90-122.

1971. Syntax since Aspects. GUMSLL 24:1-18.

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Casagrande, Jean. 1969. On the sources of some universals. PIL 1:76-90. [Argues for abstract performative verbs on the basis of data from French.]

Darden, B.-J. 1971. On confirmative tag sentences in English. Mimeographed, University of California at Berkeley, Slavic Dept. [Presents additional evidence for auxiliary verbs as main verbs.]

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Fillmore, Charles J. 1968. The case for case. BaH 1-88.

1970. The grammar of hitting and breaking. JR 120-134.

1971. Some problems for case grammar. GUMSLL 24:35-56.

Gallagher, Mary. 1970. Adverbs of time and tense. CLS6 220-225.

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Cook, Eung-Do. 1971. Phonological constraint and syntactic rule. LI 2·465-478.

Dingwall, William Orr. 1969. Secondary conjunction and universal grammar. PIL 1:207-230. [Discusses language-specific constraints on gapping.]

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1970. Surface structure constraints in syntax. LI 1:187-256.

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1972. A global constraint on pronominalization. LI 3:35-60.

Ross, John R. 1969. Guess who? CLS5 252-287. [Uses identity-of-sense deletions to argue against the Extended Lexicalist hypothesis of no deletions. Shows that 'Ross constraints' must be stated globally.] (DRO).

1972. Doubl-ing. LI 3:61-86. [Discusses constraints against two successive forms in -ing in English.]

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1970. On post-determiner quantifiers. LI 1:415-428.

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1970. Sloppiness. Duplicated, University of Göteborg. [Treats identity-of-sense anaphora]

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STUDIES IN THE LINGUISTIC SCIENCES
(WORKING PAPERS)

# STUDIES IN BALTIC LINGUISTICS

Edited by

**Hans Henrich Hock**
**and**
**Michael J. Kenstowicz**

**VOLUME 2, NUMBER 2**
**FALL, 1972**

DEPARTMENT OF LINGUISTICS, UNIVERSITY OF ILLINOIS
URBANA, ILLINOIS 61801

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# FOREWORD

The original impetus for this special issue of SLS derives from the course Linguistics 303 ("The Structure of Lithuanian") first offered by the U of I Linguistics Department during the 1968 Linguistic Institute, when it was taught by Mr. Jonas Kavaliunas, and taught again during the 1970-1971 academic year by Hans Henrich Hock.

As a result of the fact that Kenstowicz's contribution to this volume, a revision of his 1971 U of I Ph.D. dissertation, was still in progress while the other papers contained in this volume were being written, it was generally impossible to refer to such specific details of the revised version as the precise format of particular rules. Instead, it was necessary to refer to the original 1971 version of his dissertation. However, this does not appear to have crucially affected any of the particular arguments in these other papers.

We wish to express our gratitude to Sue Dennis, Barbara Doyle, Lynne Hellmer, and Josephine Wilcock for invaluable aid in the production of this volume.

The Editors

## ORTHOGRAPHY

Since many of the citations in this volume are in the Standard Lithuanian orthography, the following brief summary of the writing system is presented on the reader's behalf.

There are three accent signs in the orthography. An acute, which indicates a falling contour on the accented syllable, a circumflex indicating a rising contour, and a grave accent sign which indicates merely stress or accent without any perceptible contour on the syllable.

Lithuanian employs a Latin alphabet with a few modifications. Unless otherwise noted, the letters have the usual phonetic interpretation (i.e. "p" stands for a voiceless bilabial stop, etc.). Exceptions are "c" and "dz" which are voiceless and voiced dental affricates, and "dž", the voiced counterpart of "č", a palatal affricate. All consonants except "j", a front glide, can be palatalized or "soft" and velarized or "hard". Consonants are palatalized when followed by a front vowel letter, either "i" or "e". When palatalized consonants occur before a back vowel, the palatalization is indicated by inserting the letter "i" between them and the following back vowel letter, this "i" representing no additional sound. Thus, bliauti is [b'l'aut'i]. Also, since the sound [i] never occurs before a back vowel letter it always indicates a mere palatalization of the preceding consonants, the only exceptions to this being foreign borrowings like biologia, where the "i"s do represent high front vowels.

There are six vowel letters: "a", "e", "i", "o", "u", and "y". These have the usual phonetic value except that "y" represents [i:]. These letters are modified in various ways to indicate vowel length. There are three ways in which vowel length is represented in the orthography. First, a given letter may always represent a long vowel. There are two such letters: "y" which always represents [i:] and "o" which always designates a long, tense [o:] except in foreign borrowings like poètas where it stands for a short lax mid vowel, and in the

diphthong "uo" where it stands for a reduced variant of the vowel a ("uo" = [uʌ]). Secondly, vowel length may be indicated by means of a diacritic. The letter "ė" always represents long, tense [e:], while "ū" represents [u:]. The other diacritic used to represent length is a nasal hook written under the letter. Note that this hook does not represent nasalization of the vowel, for all vowels are oral in contemporary Standard Lithuanian. Thus, "ą" = [a:], "ę" = [ɛ:], "į" = [i:], and "ų" = [u:]. The letters "ę̇" and "ǫ" do not occur. Finally, a letter can indicate a long vowel by virtue of its accent sign. This only happens with the letters "e" and "a", which designate long vowels when the acute or circumflex is written directly above them. Here the long "e" is open and lax [ɛ:] for example, lẽdas is [l'ɛ:das] and rãtas is [ra:tas]; also, gérti is [g'ɛ:r't'i] and lángas is [la:ngas]. In all other cases, the vowel letters indicate short vowels.

For ease of reference, the following short list if the vowel sounds and the letters used to represent them is provided.

| | | | |
|---|---|---|---|
| [i] | i, ì | [i:] | y, ỹ, ý, į, į̀, į́ |
| [u] | u, ù | [u:] | ū, ũ, ú, ų, ų̃, ų́ |
| [ɛ] | e, è | [e:] | ė, ė̃, ė́ |
| [a] | a, à | [o:] | o, õ, ó |
| | | [a:] | ã, á, ą, ą̃, ą́ |
| | | [ɛ:] | ẽ, é, ę, ę̃, ę́ |

One final point. When the letters "i" and "u" form a mixed diphthong with a following liquid or nasal in a closed syllable and in addition the syllable has a falling accent, then instead of writing an acute accent over the "i" or "u", a grave accent is written. Thus, for example, in dìrbti and gìmti, the first syllable has a falling contour and the letter "i" represents a short vowel. This is the only case in which the grave accent sign is used to represent a pitch contour. Evidently, the rationale behind this is the desire to preserve the generalization that acute accent may only occur over a letter which represents a long vowel.

# LITHUANIAN PHONOLOGY

Michael Kenstowicz

## Preface

The following description of Lithuanian phonology is a slightly revised version of my doctoral dissertation (Kenstowicz, 1971). An initial draft of the latter was completed in the spring of 1969 and distributed in ditto form to a limited number of colleagues. The final version of the dissertation (and hence the work reported in this volume) differed from the initial 1969 draft in two chief ways.

First, the initial draft was longer. It contained material on the phonology of the nominal desinences which is lacking in the work reported here. In addition, the initial draft contained some material on verbal accentuation, most of which can be found in Kenstowicz (1970a). Finally, a section on the representation of vowel length is not reported here, because this was published separately as Kenstowicz (1970b).

Secondly, the initial draft of the thesis the Lithuanian accents were described in terms of moras. However, in the final version (and hence in the work reported here), following Halle's (1971) work on Slovene, the Lithuanian accents are described in terms of the interplay between stress with high and low pitch. Recent work by Paul Kiparsky (1972) demonstrates how certain difficulties with the mora notation (some of which I discuss in section 3) can be overcome if it is assumed that all moras to the left of the phonologically accented mora are redundantly accented.

Lithuanian accentual phonology has recently been subjected to a number of generative studies: Heeschen 1967, Darden 1970, Robinson 1970, Zeps and Halle 1972, and Kiparsky 1972, in addition to some of the papers assembled in the present volume. My description was written in ignorance of all of these except the first, which is discussed in some detail in section 3.3. Out of all these descriptions, I believe that Kiparsky's approach offers the most promise of providing a truly

explanatory account of the Lithuanian accents and that it surpasses my analysis. However, in the area of segmental phonology the analysis presented here is, to the best of my knowledge, the only generative account available. Although I am by no means entirely satisfied with it, I believe that the description of segmental phonology presented in sections 1 and 2 is, in general, correct. However, it is primarily limited to the alternations appearing in verbal and, to a lesser extent, nominal inflection. Except in a couple of cases, derivational morphology (and the phonology resulting therefrom) has not been treated. For those who wish to carry the study of Lithuanian phonology further than I have been able to, the following sources have been the most helpful to me: Otrębski 1956, 1958, 1965; Senn 1966; Stang 1942, 1965; Balcikonas 1954.

# 1. GENERAL PHONOLOGICAL PROCESSES

## 1.1 The Vowel Inventory

The following vowels appear in a broad phonetic transcription of Standard Lithuanian.

(1)

| | | | | |
|---|---|---|---|---|
| i: | i | | u: | u |
| ė: | | | o: | |
| e: | e | | | o |
| | | a: | a | |

The symbols ė: and o: represent long tense mid vowels, which are closer in articulation than the lax open mid vowels e and o. The a is a relatively central low vowel, while the symbols i and u represent the usual feature matrixes, ie. a high front unround and a high back rounded vowel, respectively.

Some of the low vowels have allophonic variants. In particular, long and short a are retracted before hard (velarized) consonants, while e: is lowered to ä: in this context. Since short open o only appears in foreign borrowings, it may be removed from the inventory of native sounds. Consequently, we may tentatively assume an underlying vowel system with a fair degree of symmetry:

(2)

| | | | |
|---|---|---|---|
| i: | i | u: | u |
| ė: | | o: | |
| e: | e | a: | a |

Phonetically, the following diphthongs occur: ai, au, ei, ie, ui, and uo. Although these sounds are articulated in one vocal gesture and are therefore both members of the same syllable, phonologically they act like separate, individual vowels, and are so treated. These diphthongs will be termed "vocalic" in order to distinguish them from the "mixed" diphthongs--vowels followed by a liquid or a nasal in a closed syllable.

1.2 Secondary Lengthening

In Lithuanian there is a very general process whereby lax non-final open e and a are lengthened when accented. Because of the mobility of the accent, this gives rise to alternations like the following.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (3) | nom. sg. | lẽdas | [l'e:das] | 'ice' | rãtas | [ra:tas] | 'wheel' |
| | loc. sg. | ledè | [l'ed'e] | | ratè | [rat'e] | |
| | 1 sg. pres. | meĉù | [m'etu] | 'throw' | kasù | [kasu] | 'dig' |
| | 3 sg. pres. | mẽta | [m'e:ta] | | kãsa | [ka:sa] | |

This lengthening also occurs in diphthongs, both of the vocalic and the mixed type.

| | | | | |
|---|---|---|---|---|
| (4) | nom. sg. | káimas | [ka:imas] | 'village' |
| | nom. sg. | vaĭkas | [vaikas] | 'child' |
| | nom. sg. | lángas | ]la:ŋgas] | 'window' |
| | loc. sg. | langè | [laŋge] | |
| | nom. sg. | bérnas | [b'e:rnas] | 'servant' |
| | nom. pl. | bernaĭ | [b'ernai] | |

In addition to not applying word-finally, this lengthening does not occur in prefixes: eg. àtnešа from /at=nešа/, where = is used to represent the prefix boundary, 3. pres. 'bring near'.

There are two sorts of exceptions to secondary lengthening. First, a very few lexical items like màno 'mine', and foreign borrowings like poètas 'poet'. Secondly, within the verb there are several contexts where lengthening regularly does not occur if the accented e and a are in the stem final syllable. These are the infinitive, the future, and the imperative, in addition to several other verbal formations which are not discussed in this work. All of these contexts where secondary lengtheing blocks are characterized by the fact that the suffix following the verb stem begins with a consonant.

| (5) | infin. | kàs-ti | 'dig' | nèš-ti | 'carry' |
|---|---|---|---|---|---|
| | imper. pl. | kàs-kite | | nèš-kite | |
| | 1 sg. fut. | kàsiu (/kas-siu/) | | nèšiu (/neš-siu/) | |

But even in these contexts lax a and e are lengthened if they appear as the accented member of a diphthong. In the following, the roots are [ka:u-] and [g'e:r-].

| (6) | infin. | kȃuti | 'beat' | gérti | 'drink' |
|---|---|---|---|---|---|
| | imper. pl. | kȃukite | | gérkite | |
| | 1 sg. fut. | kȃusiu | | gérsiu | |

Since all of the environments in which lengthening regularly does not apply are characterized by post-stem morphemes beginning with a consonant, it might be expected that the rule is restricted to apply only in open syllables with the proviso that a resonant may intervene:

(SL) $[\overset{X}{a}, \overset{X}{e}] \rightarrow [+ \text{long}] \; / \; ___ \; ([+ \text{sonorant}])\, C\, V$

However, forms like the following show that this formulation of the rule cannot be maintained.

| (7) | nom. sg. | rãktas | instr. sg. | raktù | 'key' |
|---|---|---|---|---|---|
| | 3 pres. | mẽzga | infin. | mègzti | 'bind' |
| | 3 pres. | rẽzga | infin. | règzti | 'knit' |

These forms indicate that the lengthening can take place if the consonants following the accented vowel are members of the same morpheme as in mẽzga ( [m'e:zg-a] ), but not if one of the consonants belongs to a different morpheme as in the infinitive mègzti ( [m'ek's'-t'i] ). But even this formulation is incorrect. There is a general derivational pattern whereby intransitives are formed by the addition of the suffix -s.

(8) inf. knabsóti 3 pres. knãbso 'brood' (cf. knabìs 'glum person')
snapsóti snãpso 'gape' (cf. snãpis 'bill, beak')

A form like knãbso would therefore be represented as /knab-s-o/, where the s belongs to a different morpheme from the b. Nevertheless, lengthening still takes place.

From these data it appears that the environment for lengthening must be characterized as follows. Accented open e and a are lengthened non-finally, except if these vowels are in the stem-final syllable of a verb and the ending immediately following the verb stem begins with a consonant with no resonant intervening. Since it is clear that there is a general process of lengthening non-finally, instead of attempting to build this restriction into the rule itself, these contexts in the verb where the rule blocks will be treated as exceptions.

In The Sound Pattern of English several ways of treating exceptions are distinguished. First, individual formatives can be marked as exceptions to a rule. In the present instance, the morpheme màno would fall into this class, since there is nothing about the phonological or syntactic nature of the morpheme indicating that it should be exceptional in regard to the lengthening rule. Such treatment for individual morphemes is of the highest cost, correctly reflecting their idiosyncratic behavior. Second, the fact that an item is an exception to a rule is often predictable from other properties associated with it. These properties may be phonological as well as non-phonological in nature. For example, foreign borrowings are exceptions to the lengthening rule. Since there are many other rules which these borrowings fail to undergo, an across the Lexicon categorization into /± NATIVE/ is made, and a lexical redundancy rule of the form /- NATIVE/ → /- Secondary Lengthening/ is established, thereby distinguishing forms like poètas from the genuinely idiosyncratic ones like màno. Exceptional behavior can also be predicted from the phonological character of the item in question. This is accomplished by readjustment rules,[1] which mark a segment as not undergoing a rule it otherwise would depending upon the context in which it occurs. Thus, in the present case, we can block forms like kàsti,

kàskite, kàsiu, etc. from undergoing the Secondary Lengthening rule by formulating a readjustment rule of the following form:

$$\text{(RR1)} \qquad V \rightarrow [\,-\,\text{SL}\,] \,/\, \underline{\quad}\; \overbrace{[\,-\,\text{sonorant}]_1}^{\text{verb stem}} \;+\; C\,V$$

It is assumed here that the morphological structure of a Lithuanian verb form consists of a stem plus an ending and that the phonological rules may refer to this structure.

The Secondary Lengthening rule itself can now be formulated as:

$$\text{(SL)} \qquad [\,\overset{x}{a},\ \overset{x}{e}\,] \rightarrow [+\,\text{long}] \,/\, \underline{\quad}\; C_o\,V$$

The forms kãsa, kàsti, gérti, mẽzga, mègzti and knãbso are derived as follows:[2]

| | /kãs\|+a/ | /kãs\|+ ti/ | /gẽr\|+ ti/ |
|---|---|---|---|
| RR1 | ------ | -SL | -------- |
| SL | kã:s+a | ------- | gẽ:r+ti |

| | /mẽzg\|+ a/ | /mẽgz\|+ ti/ | /knãb+s\|+ o/ |
|---|---|---|---|
| RR1 | -------- | -SL | ---------- |
| SL | mẽ:zg+a | -------- | knã:b+s+o |

In order to prevent SL from applying to a form like àtnešа from /àt nešа/, it will be assumed that the prefix boundary blocks the rule. This in turn suggests another possible analysis for blocking SL in forms like kàsti. We could set up a special boundary between the stem and the consonant initial suffixes, and constrain the rule from applying across it too. The validity of this alternative depends upon what independent

evidence can be adduced for setting up this boundary. As the analysis develops we shall encounter a number of other rules which fail to apply across the boundary between the stem and the consonant-initial verb suffixes. However, there are in addition a number of other rules which do apply in this context. For the moment then I will assume that the re-adjustment rule solution is correct.

## 1.3 The Consonant Inventory

The following consonants appear in the phonetic output of Standard Lithuanian:

(9)

| | | | | |
|---|---|---|---|---|
| p | t | | | k |
| b | d | | | g |
| f | s | š | | ch |
| v | z | ž | | |
| | c | č | | |
| | dz | dž | | |
| m | n | n | | |
| | l,r | | | |
| | | j | | |
| | | | h | |

All these sounds occur in palatalized and non-palatalized varieties except for j, which is always palatalized. However, three of the segments are limited to foreign borrowings. These are f,(cf. fãbrikas 'factory', frõntas 'front'); ch (cf. chaõsas 'chaos, chõras 'chorus'); and h (hõtelis 'hotel', hĩmnas 'hymn'). The dental affricates c and dz appear in onomatopoetic formations and in borrowings only. Most occurrences of č and dž are predictable from dental stops, the remaining showing up in onomatopoetic words or in borrowings. The palatal and velar nasals are variants of n. I will also provisionally claim that v derives from an underlying w, which in turn along with j derives from an underlying high vowel and that it is possible in general to predict the palatalization of the consonants. This limits the underlying consonant inventory in native

words to the following:

(10)

| | | | |
|---|---|---|---|
| p | t | | k |
| b | d | | g |
| | s | š | |
| | z | ž | |
| m | n | | |
| | l,r | | |

1.4 Palatalization and Voicing Assimilation

In Lithuanian there are a couple of phonological rules which distribute a feature throughout a consonant cluster. One of these is the sharping rule which palatalizes any number of consonants before front vowels and j.

(Sharping) $C_1 \rightarrow C' \; / \; __ \; [ \; \begin{matrix} - \text{ cons.} \\ - \text{ back} \end{matrix} \; ]$

Due to subsequent rules the palatalized consonant may come to stand before a back vowel, in which case the degree of palatalization is stronger than before front vowels.

Another such rule is Voicing Assimilation, which specifies a single value for voicing for any number of obstruents in sequence depending upon the value for voicing of the last member of the sequence.

(Voice) $[ \text{ - sonorant } ]_1 \rightarrow [\alpha \text{ voice}] \; / \; __ \; [ \; \begin{matrix} \text{ - sonorant} \\ \alpha \text{ voice} \end{matrix} \; ]$

The only segment which is an exception to this rule is v, which allows a voice contrast before it: tvãnas 'flood', dvãras 'estate', kvẽpti 'to peck', gvẽra 'slattern'. Hence, with respect to voicing assimilation v behaves like a sonorant such as r: trámda 'retardation', draũgas 'friend', kraũjas 'blood', graudùs 'sad'. The surface obstruent v is also strange in that it does not occur before a consonant or at the end

of a word. The only other sound having this distribution is the glide j, which in addition does not occur after a consonant. Furthermore, there are a number of contexts in which u alternates with v and i alternates with j. These alternations are described in the next chapter, where I will formulate a rule converting u and i to homorganic glides in position before a vowel. However, this rule must be restricted to apply across a morpheme boundary and so prevents us from deriving the v of tvãnas from u. Still it is possible to derive v from a basic w which will permit us to hook up the failure of v to condition voicing assimilation with its partially parallel to j phonotactics. Hence, I will analyze tvãnas as basic /twanas/ and add to the grammar a w → v rule ordered after Voicing Assimilation. Also, we will later require a rule to delete j after a consonant. These rules are formulated quite simply as follows:

(w-v) w → v

(j-∅) j → ∅ / C ___

## 1.5 Nasal Assimilation

The dental nasal n assimilates in point of articulation to a following stop or affricate, while the labial nasal m does not.

(11)

| | | |
|---|---|---|
| inf. | pìnti | [..nt..] 'plait' |
| 3 pres. | pìna | [..n..] |
| imp. pl. | pìnkite | [..ŋk..] |
| nom. sg. | sẽnas | [..n..] 'old' |
| nom. sg. | sénbernis | [..mb..] 'old fellow' |
| nom. sg. | dantìs | [..nt..] 'tooth' |
| dat. sg. | dañčiui | [..nč..] |
| nom. sg. | šìmtas | [..mt..] 'one-hundred' |
| infin. | témti | [..mt..] 'darken' |
| imp. pl. | témkite | [..mk..] |
| 3 past | tẽmo | [..m..] |

The assimilation of n is accounted for by the following rule (where F stands for the point of articulation features).

(Nasal Assim.) $\quad n \rightarrow [\alpha\ F] \ / \ ___ \ [_{\alpha\ F}^{-\ \text{contin.}}]$

It is worth observing that on the basis of this data it is possible to construct an argument parallel to Halle's famous one in Russian against the "taxonomic" phoneme. In taxonomic phonemics the palatal and velar allophones of n can be grouped together with n into the phoneme /n/ on the basis of complementary distribution and phonetic similarity. An allophonic rule of the form /n/ assimilates in point of articulation to a following palatal or velar would then be required. But it is not possible to treat the change of n to m before a following labial as allophonic, since this would merge with underlying m and thus violate biuniqueness. Rather, the shift of n to m would have to be treated as a morphophonemic rule Thus, "taxonomic" phonemics makes the claim that the shift of n to a palatal or velar nasal is a fundamentally different phonological phenomenon from the change of n to m and that the tendency for these two rules to co-occur in the same language is an accident. However, this is anything but the case, and all other things being equal, one would expect both assimilations to be treated as being instances of the same process--assimilation of a dental nasal in point of articulation to a following stop. Hence,arguments of this type pursuasively falsify the claim that the taxonomic phoneme (ie. defined in terms of bi-uniqueness) defines a linguistically significant level of representation.

It cannot be determined whether n assimilates to non-vowels other than stops, because there is another rule which elides n, (compensatorily) lengthening the preceding vowel, when the n is followed by j, v, s, z, š, ž, l, r, m, or n. This is shown most clearly by forms containing the prefix sán-.

| | | | | | |
|---|---|---|---|---|---|
| (12) | sámbūris | 'assembly' | cf. | bū̃rỹs | 'crowd' |
| | sampilas | 'stock, store' | | pìlnas | 'fu-l' |
| | sándora | 'covenant' | | dorà | 'virtue |
| | sántaka | 'confluence' | | tekė́ti | 'to flow' |
| | sánkaba | 'coupling, clamp' | | kãbė | 'hook' |
| | są́junga | 'union' | | jùngas | 'yoke' |
| | są́voka | 'idea' | | vókti | 'understand' |
| | są́skambis | 'harmony' | | skambė́ti | 'ring' |
| | są́šlavos | 'sweepings' | | šlúoti | 'sweep' |
| | są́žinė | 'conscience' | | žinóti | 'know' |
| | są́lytis | 'clash, contact' | | lýti | 'to rain' |
| | są́rašas | 'list, register' | | rašýti | 'to write' |
| | są́mokslas | 'conspiracy' | | mókslas | 'skill' |
| | są́narys | 'joint' | | narỹs | 'link' |

Before discussing the operation of this rule, I will formulate its context and will refer to this context with the cover symbol Z.

$$(n\text{-}\emptyset) \qquad \underline{\qquad} \quad \left\{ \begin{matrix} [-\text{ sonorant}, + \text{ contin.}] \\ [-\text{ syllabic}, + \text{ sonorant}] \end{matrix} \right\}$$

The actual process of nasal elision can be formalized in a number of different ways. In traditional terms, the lengthening is considered compensatory upon the elision of the nasal. Implicit in this formulation is a dependency relation between these two operations such that the lengthening is dependent upon and evoked by the elision. However, it is not possible to adopt this formulation into a generative grammar, because after the nasal elides there is no way to distinguish forms which had the nasal from those which did not in order to compensatorily lengthen the correct vowel. In order to accomplish this distinction, it would be necessary for the rules to apply in a "non-markovian" fashion. But such rule applications are not permitted in the present theory.

Within generative grammar there are essentially three different ways in which the nasal elision can be described. First, the traditional description can be reversed so that the vowels are first lengthened in the context where n elides and then the elision is formulated as a separate rule.

(V-V:) $V \rightarrow [+ \text{long}] \; / \; ___ \; n \; Z$

(n-Ø) $n \rightarrow \emptyset \; / \; ___ \; Z$

There are at least two criticisms of this analysis which are serious enough to reject it out of hand. First, the two rules must be stated with essentially the same environments and yet they cannot be collapsed, claiming there is no significant connection between them. But it is clear that there is such a connection, which is shown by the fact that if a morpheme is an exception to one of the rules, then it is to the other as well. For instance, the future morpheme /-si/ exceptionally does not condition nasal elision. But the vowel remains short in forms like mìnti, mìnsiu 'remember/ (not mynsiu as would be predicted by this analysis). Secondly, this description seems to claim that the elision of the nasal is somehow dependent upon the prior lengthening of the vowel, contrary to the traditional formulation and to intuition.

A second way to treat this problem is to use a transformational rule permitting the two processes to be collapsed. This would obviate the difficulty of having exceptions to both rules encountered by the first desription.

$$\begin{array}{cccccc} V & n & Z & \rightarrow & 1 & \emptyset & 3 \\ 1 & 2 & 3 & & [+\text{long}] & & \end{array}$$

Recently, another analysis for these data has been proposed by Lightner (1970). Two rules are involved. First a rule which nasalizes a vowel before a nasal-Z cluster. Secondly, there is a rule completely assimilating the nasal to the preceding nasalized vowel.

$$V \rightarrow [+\text{nasal}] \;/\; ___\; N\ Z$$

$$N \rightarrow [\alpha\ F's] \;/\; V\ ____\ [\alpha F's]$$

Lightner proposes that such assimilation rules be explicitly interpreted by phonological theory as not referring to suprasegmental features, this being indicative of "a general split between segmental and suprasegmental phonology." A subsequent rule denasalizes all vowels, as there are no nasalized vowels in present-day Standard Lithuanian.

One of the things which superficially supports this analysis involves a heretofore unmentioned problem. This has to do with the preservation of the accent in a syllable which loses its nasal. As will be shown later, rising and falling accents can be interpreted as high pitch on the final and initial mora of a syllable. Thus, brę́ndo 3 past 'ripen' and breñto 3 past 'rot' may be represented as /brę́ndo/ and /breñto/ (recall that a closed syllable nasal may count as a mora). The corresponding infinitive forms for these verbs are brę́sti and brę̃sti, where the stem-final dental stops have been turned into s which conditions the loss of the underlying n. Notice that the accentuation of the syllable remains constant. Assuming a mora representation, the required output of the nasal elision process would have to be /brę́esti/ and /breę́sti/. Lightner's analysis accomplishes this, as the following derivation shows.

| | /brę́ns-ti/ | /breńs-ti/ |
|---|---|---|
| (V-Ų) | brę́ns-ti | breńs-ti |
| (N-Ų) | brę́ęs-ti | breńs-ti |
| (Ų-V) | brę́es-ti | breés-ti |

Despite its attractiveness, I think that there are several objections that can be raised against this analysis. First, given the fact that there are no nasalized vowels in the present-day language, the introduction of an oral-nasal contrast in the course of the derivation requires justification. Presumably what is involved here is the true premise that

frequently in human languages long nasalized vowels correspond to underlying oral vowel plus nasal consonant sequences. Given the frequent and widespread character of this correlation, it is assumed that a universal underlying process is involved, in order to account for the striking similarity in language after language. And when similar but not identical surface-underlying correlations are encountered, it is assumed that the same universal process of vowel nasalization is at work, but that there are additional, language particular factors obscuring the situation (denasalization in the present case).

It is important to remember that the introduction of the nasalized vowels in this analysis is based solely upon such universal considerations. However, there is, I think, another such consideration which indicates that vowel nasalization is not at work here. This is the fact that it is only the dental nasal n and not the labial m which drops out before Z. Thus, parallel to the forms brę́sti, bréndo, we find pairs like the following: krim̃sti, krim̃to 'chew'; grim̃zti, grim̃zdo 'sink'; glámžyti 'rumple'; etc., where m remains before the fricative. Since vowel nasalization before n but not m seems rather uncharacteristic of the universal process of vowel nasalization, it is doubtful that such nasalization underlies the dropping of the n in Lithuanian. It would be possible of course to circumvent this difficulty by permitting vowel nasalization before both m and n, but then restrict the loss of the nasal consonant to just n, with subsequent denasalization of all vowels. However, given such latitude of analysis, the claim that nasalization underlies the Lithuanian data becomes rather trivial and hence loses much of its initial appeal.

Another objection that can be raised against this analysis involves its questionable appeal to the notion of complete assimilation. Note that in the assimilation of the nasal, no trace of the original segment--the n--is retained. But it is reasonable to suppose that assimilation is of a continuous nature, in which one segment becomes more and more like another to the limiting case of complete identity. Furthermore, it seems that clear cases of complete assimilation arise only when the two

segments are phonetically similar to begin with. For example, in the next section a rule will be formulated which turns dental stops to continuants before dental stops. This rule also applies before dental continuants. Thus, beside the 3 past and infinitive forms mẽto and mèsti 'throw', we find the 1 future form mèsiu < /mes-siu/ < /met-siu/. Here we can say the root final t is completely assimilated to the following s, but only by virtue of the fact that t and s share a fair number of features in common to begin with. Finally, it is reasonable to assume that a hierarchy is involved in assimilation, such that complete assimilation implies partial assimilation, but not vice versa. Thus, dentals and velars assimilate to a palatal point of articulation when adjacent to high or front vowels. But t/k → i (without any intermediate stages) is most unlikely.

If these remarks are correct, then the assimilation analysis for Lithuanian vowel-nasal sequences becomes rather suspect. Not only are there no properties of the nasal left behind; it is difficult to imagine what such traces might be in a case such as this, where the distance between n, a consonant, and a vowel is rather great, involving a transition across most of the feature properties.[3]

The traditional analysis--elision of the nasal plus compensatory lengthening of the vowel--provides a much more straightforward treatment of the data and furthermore expresses the correct (in my opinion) intuition that the lengthening of the vowel is dependent upon the elision of the nasal. Although it might be argued that on the basis of just this one rule it is not possible to tell if such a dependency relation exists, there are actually several other places in the grammar where n is elided, and in each of these cases the preceding vowel is lengthened. One such context is word-finally, where in the phonetic representations of Lithuanian n does not typically occur. This is shown most clearly by participial forms like nešą̃ from /neš-an/ nom. pl. pres. act. part. 'carry' (cf. nešãs nom. sg. and nešanti acc. sg.), and in the nominal declension: eg. gen. pl. galvų̃ from /galv-un/ 'head' (cf. the allative pl. galvumpi from /galv-un-pi/).

There are several other places where such compensatory lengthening takes place, though they are more sporadic in nature, occurring in the old n and r stems primarily. For example, nom. sg. akmuõ, acc. sg. ãkmenį 'stone'. Here the root is underlying /akmen-/. There is a special minor rule which backs the root vowel e to o . When the n elides this o is lengthened and eventually shows up as the diphthong uo, again by a minor rule. In this connection compare also duktẽ, dùkterį 'daughter' and sesuõ, sẽserį 'sister'.

In each case then, when a nasal is elided in a closed syllable, the preceding vowel is lengthened compensatorily, thereby preserving an equilibrium in the length of the syllable. Since this occurs in several quite different parts of the grammar, it seems that the co-occurrence of lengthening with the loss of the n is not accidental.

I suggest dealing with this along the following lines. Analogous to the marking conventions porposed in The Sound Pattern of English, I set up a convention in the grammar of Lithuanian which says that upon the elision of a sonorant in a closed syllable, the preceding vowel is lengthened. This convention is not universal, but rather language particular in nature. This description of the process overcomes the difficulties encountered by the previous analyses in what seems to me a natural fashion. First, in accord with the traditional insight, it renders the lengthening concomitant with and dependent upon the elision. Secondly, since marking conventions apply in a "non-markovian" fashion, it overcomes the problem of distinguishing which forms have undergone elision of the nasal and which have not by means of an already existing apparatus. This then will permit Nasal Elision to be formulated as

(Nasal Elision) $\quad n \rightarrow \emptyset \; / \; ___ \; Z$

Aside from foreign borrowings (eg. sanskrîtas'Sanskrit'), n does not elide before the future suffix -si.

(13) inf. gyvénti 1 sg. fut. gyvénsiu

| | | | |
|---|---|---|---|
| mìnti | mìnsiu | 'trample' |
| gìnti | gìnsiu | 'defend' |

1.6 Assibilation

The old Indo-European rule assibilating dental stops survives in a somewhat altered form in Lithuanian. According to this rule dental stops become strident continuants. In Lithuanian this rule applies in three contexts: before dental stops, before dental continuants, and before k. This is shown by the varying pronunciations of the following verb stems which end in a basic dental stop:

(14)

| | | | | |
|---|---|---|---|---|
| 3 sg. pres. | mẽta | vẽda | kãsa | lẽsa |
| irfin. | mèsti | vèsti | kàsti | lèsti |
| 1 sg. fut. | mèsiu | vèsiu | kàsiu | lèsiu |
| 3 sg. freq. | mèsdava | vèsdava | kàsdava | lèsdava |
| 2 pl. imp. | mèskite | vèskite | kàskite | lèskite |
| gloss | 'throw' | 'lead' | 'dig' | 'peck' |

However, as the following nominal forms show, assibilation before k is limited to the imperative, while the rule applies generally before dental stops and fricatives in these other environments.

(15)

| | | | | |
|---|---|---|---|---|
| sprū́stis | /sprūd-tis/ | 'crowded mass' | cf. sprū́sti, sprū́do | 'crush' |
| narsas | /nart-sas/ | 'anger' | nertė́ti | 'rage' |
| smársas | /smard-sas/ | 'smell' | smardìnti | 'stink' |
| sandė̀tkas | | | | |
| susiedka | 'neighbor' | | | |

Initially two possible analyses present themselves. First, we could have in addition to a general rule of assibilation defined to operate before dental stops and continuants, another minor rule assibilating dental stops just before the k of the imperative. Or secondly, we might formulate

a single rule, but treat it conjunctively as follows:

$$[\ t,d\ ] \rightarrow [\ s,z\ ] \ /\ ___\ \{[\ k\ ]_{\text{imperative}}\ [t,\ d,\ s,\ z]\}$$

However, there is one additional fact which casts some doubt upon the validity of either of these analyses. This is that within Lithuanian verbal system, all of the consonant initial suffixes which can be added to the verb stem begin with a dental (either t, d, or s) except for the imperative -ki, there being about ten such suffixes in all. Hence, all of these suffixes except for the imperative condition assibilation in the normal context, since they all begin with a dental stop or continuant.

Traditionally these data are described by associating with each verb stem three different shapes. One of them, the "infinitive" stem, is that which occurs after all consonant initial suffixes, including the imperative. This formulation claims that for a verb stem like /met-/, there must be atleast two lexical representations, /met-/ and /mes-/. A rule then selects the latter alternant when the stem appears before a consonant initial suffix. Generative Phonology would argue that this "item and arrangement" description is wrong, because it lists the predictable alternant /mes-/ rather than generates it by a rule (Kiparsky 1968). However, in a way this analysis does make sense of the fact that assibilation occurs before the imperative suffix, while the prior treatments do not. This is because the rule selecting the assibilated stem alternant refers to consonant initial suffixs.

What seems to be going on here is that given, first, the normal rule of assibilation (just before dentals), and second, the fact that all consonant initial suffixes appearing after the verb stem begin with a dental except for the imperative, it follows that in all of the environments except the imperative, a stem final dental stop will be assibilated. In other words, it seems that there is analogy or pressure here for the dental stop to also be assibilated in the imperative.

It is possible that this situation might have arisen as follows.

At one point in the history of the language there was a rule assibilating dental stops before dental obstruents. Also at this point it just so happened that all of the consonant initial suffixes following the verb stem began with a dental obstruent and thus conditioned assibilation. (The imperative suffix -ki is quite recent; formerly the imperative was realized by a vowel suffix, as it is in Latvian and Slavic). Now perhaps for some reason this property of conditioning assibilation reached linguistic consciousness and was expressed in a more direct fashion by a statement or information to the effect that verb stems with a final dental stop were pronounced with a final dental continuant when followed by a consonant initial suffix. Then when the imperative suffix was changed to consonant initial, this general statement projected to the imperative category as well.

Thus, the chief criticism to be made of the first two analyses is that they identify the reason for assibilation in the imperative with the velar character of the suffix. Rather, it seems to make no difference whether the imperative begins with a velar or any other consonant for the purpose of assibilation--the real reason for assibilation in the imperative is that it takes place in all the other forms of the verb when a consonant initial suffix follows.[4]

If this is correct then what is needed is to formulate the phonological rule of assibilation as taking place just before dental obstruents, and then to somehow make it apply in the imperative too, even though the latter does not phonologically meet the structural description of the rule, and finally to attributethis abberant behavior to the fact that all other consonant initial suffixes condition assibilation.

Towards this end one might first set up a readjustment rule which marks all consonant initial post verb stem suffixes as conditioning the assibilation rule. Secondly, one might allow for the possibility of rules applying to forms which do not meet the phonological specifications of a rule, if these forms are specifically marked as either undergoing or conditioning the rule. Such markings might be idiosyncratic lexical properties or, as in the present case, assigned by a readjustment rule.If this treatment were possible, the assibilation rule can be simply written

(Assibilation) [t, d] → [s, z] / ___ /t, d, s, z]

The application of Assibilation must precede Nasal Elision, as shown by the following derivations for brę́sti, bréndo.

| | /brend-ti/ | /brend-o/ |
|---|---|---|
| Assibilation | brenz-ti | ------- |
| Nasal Elision | bre:z-ti | ------- |
| Voice Assim. | bre:s-ti | ------- |
| Sharping, SL | b'r'e:s'-t'i | b'r'e:nd-o |

Since there are no double consonants in the phonetic output of Lithuanian, it is necessary to formulate a degemination rule. This rule is ordered very late in the grammar after all rules which have an effect on the feature composition of consonants, such as Assibilation, Voicing Assimilation, Sharping, etc. It is formulated as follows:

(Degemination) $C_x\ C_y \rightarrow C_z$ (where x=y=z)

Thus, kàsiu 'I will dig' and mèsiu 'I will throw' are derived as follows:

| | /kas-si-u/ | /met-si-u/ |
|---|---|---|
| Assibilation | -------- | mes-si-u |
| Voice Assim. | -------- | -------- |
| Sharping | kas'-s'i-u | m'es'-s'i-u |
| Glide, j-Ø | kas'-s'-u | m'es'-s'-u |
| Degemination | kas'-u | m'es'-u |

## 1.7 Palatal Leveling

The dental continuants s and z assimilate to adjacent palatals:

(16) 1 sg. fut. nèšiu /neš-si-u/ cf. nèšti 'carry'
1 sg. fut. vèžiu /vež-si-u/ vèžti 'convey'

| | | | | |
|---|---|---|---|---|
| nom. sg. | saussala | [saušala] | cf. | saũsas 'dry', šáltis 'cold' |
| nom. sg. | sauszemis | [sauž'em'is] | | žẽmė 'land' |
| 1 sg. subj. | mèsčiau | [m'eš'č'au] | | mèsti 'throw' |

Since the assimilation operates both progressively and regressively, the mirror image notation is used in the formulation of the rule.[5]

(Palatal Leveling) [s, z] → [š, ž] / [palatal]

This rule operates after assibilation as shown by mèsčiau (from /mes-čau/ < /met-tjau/), and before degemination as evidenced by nèšiu (from /neš-šiu/ < /neš-si-u/).

1.8 Consonantal Metathesis

There is a rather curious process in Lithuanian which reorders a fricative (s, z, š, or ž) into position after a velar stop which is followed by a consonant. This is most clearly shown in verb paradigms like the following.

| (17) | | | | |
|---|---|---|---|---|
| 3 pres. | drẽskia 'bind' | mẽzga 'bind' | blãškia 'toss' |
| 3 past | drẽskė | mẽzgė | blõškė |
| infin. | drẽksti | mègsti | blõkšti |
| 1 sg. fut. | drẽksiu | mègsiu | blõkšiu |
| imp. pl. | drẽkskite | mègskite | blõkškite |

It also appears to have operated in nouns: eg. Russian Moskva 'Moscow' is Maksvà in Lithuanian. These alternations will be accounted for by a rule of the following form:

(Consonantal Metathesis) [s, z, š, ž] [k,g C → 2 1 3

1 2 3

The rule of Consonantal Metathesis precedes Palatal Leveling and Degemination, as shown by the following derivation of bloksˇiu.

| | /blo:sˇk-si-u/ |
|---|---|
| Consonantal Met. | blo:ksˇ-si-u |
| Sharping | blo:k'sˇ'-s'i-u |
| Glide and j-Ø | blo:k'sˇ'-s'-u |
| Palatal Lev. | blo:k'sˇ'-sˇ'-u |
| Degemination | blo:k'sˇ'-u |

## 1.9 The Rule Orderings

For the rules of this chapter, I have been able to establish the following orderings:

(18) Assibilation precedes Nasal Elision (feeding; brent-ti→ brens-ti→ bre:s-ti)

Degemination (bleeding, met-ti→ mes-ti; feeding, met-si-u → mes-si-u→ mesiu)

Nasal Elision precedes Degemination (mutually bleeding, san-narys→ sanarys)

Voicing Assim. precedes w-v (non-feeding, twanas → tvanas, ≠ *dvanas

Degemination (feeding, dėg- 'burn'; dėg-kite→ dėk-kite → dėkite

Cons. Metathesis precedes Pal. Lev. (feeding, blosˇk-si-u → bloksˇsiu→ bloksˇsˇiu

Degem. (bleeding, blosˇk-kite → bloksˇkite→ feeding, drėsk-si-u → drėks-si-u→ drėksiu

Palatal Lev. precedes Degem. (feeding, nesˇ-si-u → nesˇ-sˇi-u→ nesˇiu

It is evident that most of these orderings are unmarked in the sense of Kiparsky (1968), Kenstowicz and Kisseberth (1971) and, Kiparsky (1971).

Section 1 Footnotes

1. For discussion of this device see Chomsky and Halle (1968), p. 371.

2. The reason why secondarily lengthened short-vowel syllables show up with a rising accent (kãsa), while lengthened diphthongs surface with a falling accent (gérti ~ geerti) is discussed in section 3. Also see the discussion in Kiparsky (1972).

3. It should be pointed out in this connection that in Latvian, too (historically) underlying VNC sequences there corresponds the original vowel followed by a high vowel (equal in gravity to the original preceding vowel) plus the consonant. Thus, enC gives eiC, anC gives auC, inC gives iiC, and unC gives uuC. The resultant ei and au sequences metathesize to ie and uo. For details, see Halle and Zeps (1965). It might be argued that these data support the assimilation analysis for the loss of n, where the rule could be

$$n \rightarrow \begin{bmatrix} +\text{syll} \\ +\text{high} \\ \alpha\text{back} \end{bmatrix} / \begin{bmatrix} +\text{syll.} \\ \alpha\text{back} \end{bmatrix} ___ \; C$$

But this would be true only if + high could be construed as a trace of the original n. Furthermore, the dialectal evidence from Lithuanian shows a great deal of variation in the height of vowels before the eliding nasals, suggesting that the height of the resultant vowel is not related to the original n which it replaces. For the details on the dialect variation, see Senn (1966).

4. A somewhat parallel situation exists in Slavic, again involving reflexes of the Assibilation rule. In Slavic, most verb stems ending in an obstruent end in a dental stop t or d or a continuant s or z. Due to Assibilation and Voicing Assimilation, t and d show up as s before the infinitive ending ti: cf. Old Church Slavic metǫ, mesti 'sweep', vedǫ vesti 'lead', etc. However, there a a very few stems ending in labial stops, such as grebǫ 'row' and tepǫ 'beat'. In OCS these forms show up with the stops deleted in the infinitive form: greti and tetI. But in Russian, where the Assibilation rule is still retained (cf. metu, mesti; vedu, vesti), in place of greti we find gresti. The Assibilation rule could easily be extended to also assibilate a labial stop to s before t to accomodate this form. But this would miss the point. Not only is the change from a labial stop to a dental fricative rather peculiar, the real question is why we should find s in place of b. The answer seems to lie in the fact thatof the approxiamtely fifty to sixty verbs which end in a consonant before the infinitive suffix, the vast majority show

an s in this position, either by virtue of the continuant being underlying as in nesti, nesu, or via Assibilation, as in mesti, metu. Here ag again there seems to be pressure in the system to force the otherwise phonetically unnatural replacement of b with s. Serbo-Croatian is also interesting in this regard, for here the outcome is slightly different. Instead of replacing the stem-final labial with a fricative s on analogy with kradem, krasti 'steal' , we find the s intercalated between the labial and the infinitive ending: cŕpsti, cŕpem; dúpsti, dúbem; grèpsti, grèbem; tèpsti, tépem.

5. See Bach (1968).

## 2. VERBAL PHONOLOGY

### 2.1 Glide Formation

Consider the following data:

| | | | | |
|---|---|---|---|---|
| infin. | lýti | 3 Past | lîjo | 'rain' |
| | pȗti | | pùvo | 'rot' |
| | pýkauti | | pýkavo | 'anger' |
| | dantýti | | dantîjo | 'indent' |
| | gùiti | | gùjo | 'chance' |
| | dùiti | | dùjo | 'get dizzy' |
| masc. | dù | fem. | dvî | 'two' |

Here it can be seen that when a high vowel stands before another vowel, the high vowel appears as a simple glide if it is short, as in dvî; but it appears as a short vowel followed by a homorganic glide if it is long, as in lîjo and pùvo. The resultant w then becomes v by the w-v rule.

Depending upon how vowel length is represented, this process of glide formation has two possible formalizations. If long vowels are represented with the feature [+ long], then the rule would have to be stated in the following rather offensive way:

$$\begin{bmatrix} +\text{syll.} \\ +\text{high} \\ \langle +\text{long}\rangle \end{bmatrix} \rightarrow \left\langle \begin{bmatrix} \\ [-\text{long}] \end{bmatrix} \right\rangle \quad [-\text{syll.}] \;/\; ___\; V$$

In addition, certain other ad hoc specifications would be needed to insure that underlying long acute vowels show up as a surface grave accent.

On the other hand, if long vowels are represented as geminate sequences, the rule can be stated much more elegantly:

$$[i, u] \rightarrow [j, w] \;/\; ___\; V$$

Additional support for this treatment comes from a consideration of accent. As we shall see later, acute (falling) accent may be represented as high pitch on the initial mora of a syllable, and grave accent may be interpreted as accent on syllables containing a single short vowel, i.e. syllables with a single mora. Thus, lýti, pū́ti, lìjo, and pùvo can be represented as /lǐ́iti/, /pǔ́uti/, /lǐ́jo/, and /pǔ́vo/. If the glide rule operates with vowel length represented in the geminate notation, then there is no trouble in deriving the grave accent in the past tense forms: /lǐ́i-o/ → /lǐ́j-o/; /pǔ́u-o/ → /pǔ́w-o/.

Forms such as gùiti, gùjo indicate that the glide rule must be prevented from applying within morphemes; otherwise guiti → gwiti. Similarly, the frequent occurrence of the rising diphthongs ie and uo in words like líepa 'linden tree', miẽgas 'sleep', úostas 'harbor', dúona 'bread', etc., also show that the rule must be prevented from applying within a morpheme.[1] This means that the segments v (< w) and j cannot be derived from underlying i and u morpheme internally, despite the fact that they were historically derived from the high vowels via the glide rule and still always occur before vowels in the present-day language. The glide rule is thus formulated as

(Glide) [i, u] → [j, w] / ___ + V

## 2.2 Ablauting Verbs and the Underlying Vowel System

It will be recalled that the rules of Secondary Lengthening and Nasal Elision formulated in the first chapter have the effect of deriving long vowels from underlying short vowels. On the basis of these two rules it is now possible to derive all occurrences of long open e and a from underlying short vowels. This in turn permits the removal of these vowels from the underlying system of (2), leaving us with the following inventory.

(20)

| | | | | |
|---|---|---|---|---|
| i: | i | | u: | u |
| e: | | | o: | |
| | e | | | a |

As can be seen, a certain degree of asymmetry has been introduced into the system by the removal of the long open vowels. For now there is a contrast between long and short high vowels, but the remaining vowels do not match up into long and short pairs. Considerations of universal tendencies in vowel patterning would lead us to expect that there may be evidence internal to Lithuanian for grouping together /e:/ and /e/, and /o:/ and /a/ into single underlying phonemes of the same height so that the only basic difference between them would be length. And, indeed, there is abundant evidence to indicate that this is the case.

The first source of such evidence comes from a relatively large number of verbs which are called "ablauting" in traditional terminology. Verbs of this pattern are distinguished by having a lengthened root vowel in their non-present forms. The quantity of the present tense root vowel is treated as basic here, because this is the quantity that shows up in derived nominals: eg. võgti, vãgia, võgė 'steal'; vagìs 'thief'. Depending upon the shape of the root, these verbs fall into several subclasses.

To the first subclass belong roots with an underlying short vowel followed by one or more obstruents. The lengthened e and a in the present tense are of course derived from underlying short vowels by Secondary Lengthening, since these vowels show up as short when the accent moves of them in the 1 and 2 sg. present.

| (21) | infin. | 3 pres. | 3 past | gloss |
|---|---|---|---|---|
| | tũ̃pti | tùpia | tũ̃pė | perch |
| | pũ̃sti | pùčia | pũ̃tė | puff |
| | drė̃bti | drẽbia | drė̃bė | splash |
| | drė̃ksti | drẽskia | drė̃skė | tear |
| | võgti | vãgia | võgė | steal |
| | blõkšti | blãškia | blõškė | fling |

To account for the lengthening, I will assume a special minor rule which will lengthen the root vowel of the present tense. Note that when the short open e and a are lengthened, they appear as the tense mid vowels e:

and o:. This suggests that there is a rule in the grammar, which I will call Tensing, which raises and tenses long, non-high vowels.

$$\text{(Tensing)} \quad \begin{bmatrix} +\text{syll.} \\ -\text{high} \\ +\text{long} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{low} \\ +\text{tense} \end{bmatrix}$$

I will assume that a marking convention rounds the raised a:. The Tensing rule will have to be ordered before the rules of Nasal Elision and Secondary Lengthening, since the lengthened open vowels derived by these rulesremain open and lax. By entering the Tensing rule in the grammar we can now restore the underlying vowel system to the following more symmetric pattern which, incidentally, parallels the Proto-Slavic vowel system as well.

(22)

| | | | |
|---|---|---|---|
| i: | i | u: | u |
| e: | e | a: | a |

Hence, tenseness is no longer an underlying feature; the phonemic vowel system is now defined by three phonetic features: length, height, and gravity.

The Tensing rule is probably functionally related to the Secondary Lengthening and Nasal Elision rules, in the sense that the latter two rules derive long open vowels, which would otherwise merge with the underlying vowels of the same character. To prevent this merger the Tensing rule assigns these vowels a slightly different quality in the phonetic output. In this connection it is interesting to observe that Latvian has no rule equivalent to the Lithuanian Tensing rule. But in addition, as far as I know, neither does it have a rule like Secondary Lengthening; furthermore, although it does have a rule of Nasal Elision, its outcome with the non-high vowels is quite different from Lithuanian, as mentioned in footnote 3 of the first chapter. Aside from these differences the vowel systems of the two languages are parallel. These facts about Latvian vowels, then, stregthen my opinion that the Tensing

rule serves the function of avoiding too much merger in the vowel system.

Additional evidence for deriving surface tense mid vowels from underlying long lax open vowels comes from the numerous shortening rules in the language. In each case when the underlying vowel is shortened, we find the lax open counterpart. Thus, there are numerous instances where surface ė alternates with lax open e, which may be secondarily lengthened when accented; and of surface o with a, which may also appear as a: when secondarily lengthened. At this point I will discuss two such rules, delaying treatment of the others until later.

The first of these rules is active in the derivation of verbs belonging to the second subclass of the ablauting pattern. All verbs of this group contain an underlying short root vowel followed by a liquid or nasal.

| (23) | infin. | 3 pres. | 3 past | gloss |
|---|---|---|---|---|
| | gélti | gẽlia | gélė | sting |
| | gérti | gẽria | gérė | drink |
| | lémti | lẽmia | lémė | doom |
| | kárti | kãria | kórė | hang |
| | gìrti | gìria | gýrė | praise |
| | mìnti | mìna | mýnė | trample |
| | kùlti | kùlia | kū̃lė | thresh |
| | dùmti | dùmia | dū̃mė | blow |

These roots are also marked to undergo the minor rule lengthening the root vowel in the non-present. However, this vowel appears with the reflex of a short vowel when the root is followed by a consonant, as in the infinitive, future, imperative, etc. (Phonetically. the vowels in gélti and kárti, but not gìrti and kùlti, are long; but this is due to secondary lengthening). In order to describe this shortening, I will formulate a rule shortening the root vowels before a resonant in a closed syllable. Since it can be argued that all shortening rules in Lithuanian are rules of elision operating upon vowels represented in the sequence notation (Kenstowicz 1970b), this rule will be formulated as follows:[2]

(Osthoff's Law) $V \rightarrow \emptyset$ / V ___ [l,r,m,n] C

I have been able to find only one verb which corroborates the sequence notation for length for this rule (púlti, púola, púolė 'fall'),but it is at least consistent with the generalization that all shortening rules in the language are rules of deletion. Since there are no short tense vowels in Lithuanian, this rule of Osthoff's Law will be ordered before the Tensing rule.

Before proceeding further, let us look at some derivations for these ablauting verbs.

| | /tŭ̯p-ti/ | /tŭ̯p-ia/ | /tŭ̯p-e:/ | /drĕ̯b-ti/ | /drĕ̯b-ia/ | /drĕ̯b-e:/ |
|---|---|---|---|---|---|---|
| Ablaut | tū̆:p-ti | ------ | tū̆:p-e: | drĕ̯:b-ti | ------ | drĕ̯:b-e: |
| Tensing | ------- | ------ | tū̆:p-ė | dré̯b-ti | ------- | dré̯b-ė |
| Sec. Leng. | ------- | ------ | ------- | ------- | drẽb-ia | ------ |

| | /vă̯g-ti/ | /vă̯g-ia/ | /vă̯g-e:/ | /gĕ̯l-ti/ | /gĕ̯l-ia/ | /gĕ̯l-e:/ |
|---|---|---|---|---|---|---|
| Ablaut | vā̆:g-ti | ------ | vā̆:g-e: | gē̆:l-ti | ------ | gē̆:l-e: |
| Ostoff's Law | ------- | ------- | ------- | gē̆l-ti | ------ | ------- |
| Tensing | võ:g-ti | ------ | võg-ė | ------ | ------ | gél-ė |
| Sec. Leng. | ------- | vãg-ia | ------ | gél-ti | gẽl-ia | ----- |

| | /kă̯r-ti/ | /kă̯r-ia/ | /kă̯r-e:/ | /gĭ̯r-ti/ | /gĭ̯r-ia/ | /gĭ̯r-e:/ |
|---|---|---|---|---|---|---|
| Ablaut | kā̆:r-ti | ------ | kā̆:r-e: | gī̆:r-ti | ------ | gī̆:r-e: |
| Osthoff's Law | kā̆r-ti | ------ | ------- | gī̆r-ti | ------ | ------- |
| Tensing | ------ | ------ | kõr-ė | ------ | ------ | gī̆:r-ė |
| Sec. Leng. | kár-ti | kãr-ia | ----- | ------ | ------- | ------ |

There is a third group of verbs which is also traditionally classed as ablauting. These verbs are of the shape CVu.

| (24) | infin. | 3 pres. | 3 past | gloss |
|---|---|---|---|---|
| | káuti | káuja/káuna | kóvė | beat |
| | ráuti | ráuja/ráuna | róvė | tear |
| | bliáuti | bliáuja/bliáuna | blióvė | bleat |
| | griáuti | griáuja/griáuna | grióvė | thunder |

However, it is not really clear that these roots contain underlying short vowels which become lengthened in the non-present by the Ablaut rule. This is because forms derived from these verbs show underlying reflexes of long vowels (cf. kõvė 'battle'). Hence it is probable that th the roots in (24) contain underlying long root vowels.

In any event, I assume the v of the past tense forms to be derived from an underlying u, which appears in the non-past forms, by the glide rule. (For this class of verbs the present tense suffix j (from i; cf. -ia in tùpia, etc.) alternates with the nasal infix n; see sec. 2.4). The length of the underlying root vowel only shows up when the u has become a glide, ie. when it is followed by a vowel. When the root is followed by a non-vowel, and hence the root is in a closed syllable, it shortens. This shortening can be accomodated by Osthoff's Law if the class of resonants in the context of the rule is expanded to include the high vowels as well as the liquids and glides.[3] These forms are now derived as follows:

| | /ka:u-ti/ | /ka:u-ia/ | /ka:u-e:/ |
|---|---|---|---|
| Glide | ------- | ka:u-ja | ka:w-e: |
| Osthoff's Law | kau-ti | kau-ja | ------- |
| Tensing | ------ | ------ | kow-ė |
| Sec. Leng. | ka:u-ti | ka:u-ja | ------ |

The analysis of forms like bliáuti, blióvė is considerably more difficult. The problem is to explain the palatalization of the root intial consonants. One possible analysis is to simply set up these roots with underlying palatalized consonants. However, I should like to avoid this at all costs, since sharping of consonants is generally predictable

from a following front vowel or glide. Another possiblility consistent with the rules developed so far would be to set up the roots with a j and to predict the sharping from it. Finally, the analysis could essentially recapitulate the historical development of the forms and postulate a root of the shape /ble:u-/ (cf. Old Church Slavic blěvati). We would then require a rule backing e to a when it appears before u/w. The derivation would then look like the following:

| | /ble:u-ti/ | /ble:u-e:/ |
|---|---|---|
| Glide | -------- | ble:w-e: |
| Sharping | b'l'e:u-t'i | b'l'e:w'-e: |
| backing | b'l'a:u-t'i | b'l'a:w'-e: |
| Osthoff's Law | b'l'au-t'i | ---------- |
| Tensing | ---------- | b'l'ow'-ė |
| Sec. Leng. | b'l'a:u-t'i | -------- |
| w-v | ---------- | b'l'ov'-ė |

Elegant though this analysis may be, there are some indications that it cannot stand up. First, it involves setting up a sequence e:u which never appears phonetically. However, I have violated the spirit of this objection several times already, so perhaps it is not too strong. More important are the following considerations. There is a derivational pattern in Lithuanian in which a root diphthong loses its first component. For example, keĩsti, keĩčia, keĩtė 'change', kìsti, kiñta, kĩto 'change oneself'; daũžti, daũžia, daũžė, 'destroy', dùžti, dūžta, dùžo 'destroy oneself'. When a verb like bliáuti undergoes this derivation, the root consonants remain palatalized: džiaũgti, džiaũgia, džiaũgė 'gladden', pradžiùgti, pradžiuñga, pradžiùgo 'rejoice'. The underlying consonant here is d. Sharped dental stops are converted to palatals when followed by a back vowel. If the root vocalism eu were to be held responsible for the palatalization, this would imply that the sharping rule applies before the presumably "morphological" rule which alters the stem shape of the underlying form. But all other things being equal, one would expect such derivational rules to apply well before the point at which an assim-

ilation rule like Sharping does. This indicates that the palatalization of the root consonants in these forms cannot be attributed to the hypothesized e vocalism. Hence, we are forced into chosing between the analysis which says that the palatalization of the consonants has been lexicalized, or else to the solution which attributes the sharping to an underlying j. I shall opt for the latter solution and assign bliáuti the underlying shape /blja:u-/.

## 2.3 Metathesis

In this section we will be concerned with verbs like the following.

(25)

| infin. | 3 past | gloss |
|---|---|---|
| dűoti | dãvė | give |
| šlúoti | šlãvė | sweep |
| telefonúoti | telefonãvė | telephone |
| klýkauti | klýkavo | scream |
| dalyváuti | dalyvãvo | participate |

Since a v appears in the past tense forms of these verbs before a vowel, it is reasonable to derive this from an underlying u, which shows up in the infinitive forms, by the Glide rule. It now becomes necessary to decide on how to derive the alternant stem shapes duo-, šluo-, etc., and on how to distinguish these from stems like klykau-. Essentially three analyses are possible.

First, we might recapitulate the historical development and assign forms like 'give' the underlying stem shape /dou-/. After the glide rule has applied, there would be a rule of metathesis of the form ou → uo, which would permute all uo sequences which have not undergone the glide rule. Another rule would then be required to take o to a. Since there are no occurrences of surface short o in native words, this rule could apply with no contextual restrictions. This would give duati for the infinitive, and so another rule reducing thea to ʌ after the u would be needed to derive the correct phonetic representation for duoti

which is [duʌt'i]. This would entail a derivation like the following.

| | /dou-ti/ | /dou-e:/ | /kli:k-au-ti/ | /kli:k-au-o:/ |
|---|---|---|---|---|
| Glide | ------ | dow-e: | ---------- | kli:k-aw-o: |
| Metathesis | duo-ti | ------ | ---------- | ---------- |
| o-a | dua-ti | daw-e: | ---------- | ---------- |
| a-ʌ | duʌ-t[illegible] | ------ | ---------- | ---------- |

There are several objections that can be raised against this analysis. First, it involves setting up an underlying segment, short o, which never really occurs phonetically (except in borrowed words)---a case of "absolute neutralization." Secondly, the underlying short o introduces a lot of asymmetry back into the phonemic vowel system and hence, all other things being equal, should be avoided.

Another possible analysis would be to say that both duoti and klykauti have an underlying au vocalism , and that the different behavior of these two types of roots with respect to Metathesis is not phonetic in nature, as in the preceding analysis, but rather is essentially arbitrary and non-phonetic. That is, for example, in learning the language a person does not distinguish the two types by assigning them an underlying phonetic difference; rather he assigns them the same underlying au vocalism and merely memorizes which stems undergo Metathesis and which do not.

There is a third possible analysis which seems to avoid the problem of setting up underlying o and is still able to distinguish the two types in a non-arbitrary way. However, it has problems of its own. According to this analysis, stems like 'give' will be assigned the underlying shape /dua-/, effectively distinguishing them from the other type, which has the shape /kli:k-au-/. The Metathesis rule would now have to work in the opposite direction and be restricted to apply only when a vowel followed: ua → au / __ V. Then the glide rule would apply. Hence. dãvė would go through the following stages: /dua-e:/ → /dau-e:/ → /daw-e:/, etc.

Though this analysis avoids the problems of the first two, it is objectionable on the following grounds. The rule of Metathesis is stated in a rather unnatural fashion, since it is restricted to apply only before vowels. Such an objection is not very strong, if it were not for the fact that there is independent evidence from Latvian that the rule is formulated differently. As mentioned in footnote 3 of the first chapter, in Latvian nasals in a closed syllable are replaced by high vowelsequal in gravity to the preceding vowel. In addition, when the vowel before the nasal was low, a low-high sequence resulted from the operation of Nasal Elision. This sequence was then subject to Metathesis. Thus, to Lithuanian rankà corresponds Latvian ruoka from rauka via Metathesis. Hence, Metathesis applies to the output of Nasal Elision in Latvian in the direction au → ua; also, the context is preconsonantal and not prevocalic as required by the third analysis.

One might counter this argument with the objection that the facts of Latvian are irrelevant to a synchronic analysis of Lithuanian. However, I think that the data from Latvian are relevant in the following sense. The Metathesis rule for Lithuanian is quite old and evidently was present in the grammars of both Lithuanian and Latvian, if not Common Baltic. In Lithuanian the data to which the rule applies is such that it does not directly enable one to chose between the third analysis and either of the first two. In Latvian, on the other hand, due to the peculiarities of the rather recent Nasal Elision rule, new data has come under the control of Metathesis. And the structure of this new data is such to rule out the third analysis.

Since the number of forms which undergo Metathesis in Lithuanian is considerably smaller than those which do not, the rule will be formulated as a governed or minor ruleapplying to morphemes specifically marked to undergo it. This rule will of course be ordered after the Glide rule and formulated as follows:

(Metathesis) a u → u a

The forms duoti and davė are now derived as follows:

| | /dau-ti/ | /dau-e:/ |
|---|---|---|
| Glide | ------ | daw-e: |
| Metathesis | dua-ti | ------ |
| w-v | ------ | dav-e: |

2.4 Derived Intransitives and Nasal Infixes

There are a fair number of derived instrasitives (mostly inchoatives) which have phonological manifestations of their derived character in the present tense. These verbs are of two kinds. First, there are those which add the suffix /-st/ to the present tense stem; and second, those which infix a nasal in the present tense. What is interesting about these verbs is the distribution of the suffix vis-avis the nasal infix. This distribution is as follows.

First, if the root contains a long vowel or diphthong, either mixed or vocalic, the suffix is added.

| (26) | infin. | 3 pres. | 3 past | gloss | | | |
|---|---|---|---|---|---|---|---|
| | dýgti | dýgsta | dýgo | sprout | cf. | dygùs | 'thorny' |
| | álkti | álksta | álko | hunger | | aĩkis | 'hunger' |
| | gaĩšti | gaĩšta | gaĩšo | tarry | | gaišlùs | 'slow' |

Second, if the root vowel is basically short and the second consonant is a stop, the dental nasal n is infixed.

| (27) | | | | | | |
|---|---|---|---|---|---|---|
| | àkti | añka | ãko | become blind | akìs | 'eye' |
| | šlapti | šlaṁpa | šlãpo | get wet | šlapias | 'moist' |
| | gèsti | geñda | gẽdo | spoil | | |
| | ràsti | rañda | rãdo | find | | |

Third, if the root vowel is basically short and the second consonant is a fricative, then the root vowel appears as a lengthened circumflex and the suffix is added.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (28) | šãšti | šą̃šta | šãšo | 'grow scabby' | cf. | šãšas | 'scab' |
| | grìsti | grỹsta | grìso | 'be tired of' | | | |
| | glẽžti | glę̃žta | glẽžo | 'weaken' | | glẽžras | 'weak' |
| | mìšti | mỹšta | mìšo | 'mix' | | mìšris | 'hybrid' |

Finally, if the root vowel is short and the final consonant is a sonorant, there are two possibilities. If the consonant is a nasal, the form is suffixed; but if the consonant is a liquid, then either suffixing takes place or the root vowel is lengthened to circumflex.

| | | | | | | |
|---|---|---|---|---|---|---|
| (29) | pažìnti | pažįsta | pažìno | 'get acquainted' | žinóti | 'to know' |
| | kìmti | kìmsta | kĩmo | 'get hoarse' | kimùs | 'hoarse' |
| | bálti | bą̃la/bálsta | bãlo | 'whiten' | báltas | 'white' |
| | šìlti | sỹla/sìlsta | sìlo | 'grow warm' | šìltas | 'warm' |
| | kérti | kę̃ra/kérsta | kẽro | 'protrude' | kértė | 'angle' |

What is interesting about these forms is the distribution of the suffix. The only place in which it cannot appear is in verbs of the second group, which end in a stop. It just so happens that because of Nasal Elision, stops are the only consonants before which n can appear phonetically. On the other hand, roots of the third class, which end in a fricative, take the suffix. But still they behave like they also have a nasal infix, which of course gets lost by Nasal Elision. Not only is this indicated by the orthography, it is also suggested by the following considerations.

First, note that whenever the infix occurs in the second group, it carries the accent. The fact that the infix is accentually marked prevents the ictus from being thrown back to the prefix. Compare atmèsti - àtmeta and atràsti-atrañda. Normally roots of the shape CVC with a short vowel yield the accent to the prefix in the present tense. What is important

here is that verbs of the fricative class, which also have underlying short root vowels, behave in the same exceptional way in failing to release their accent to the prefix in the present tense: cf. atgrìsti-atgrỹsta. This parallel behavior of the fricative and stop class verbs can be explained by also infixing a nasal in the former and then deleting it by Nasal Elision, which, it will be recalled, preserves the accentuation of the syllable.

A second fact which can be explained by having the fricative class verbs undergo infixing is the length of the vowel in the present tense. Although the long circumflex ã and ẽ in šãšta and glẽžta could be attributed to Secondary Lengthening, this will not explain the length when the accent appears on the desinence: šąšt̃ù, glęžt̃ù, etc. Also, since Secondary Lengthening only applies to non-high vowels, it is of no help in explaining forms like grỹsta, mỹsta, etc. But if these verbs are treated as having an infixed nasal, the length of the vowel can be attributed to the compensatory lengthening effect of Nasal Elision.

Hence, although the nasal infix never occurs phonetically in the fricative class verbs, a good case can be made for treating these roots as undergoing the process of infixation. Similar evidence can be recruited for an analogous treatment for the roots of the fourth class with a final liquid.

But such an analysis is still at a loss to make sense of the distribution of suffixation and infixation, for it would appear a complete accident that there are some forms that undergo both processes and that these can be characterized by the context of the phonological rule of Nasal Elision. Rather, it appears that the distribution of these processes is conditioned by this phonological rule. This is rather peculiar, since typically morphological processes are stated at the underlying level of representation and are not sensative to the structure of strings after the application of a phonological rule.

In any case, perhaps this situation arose along the following lines. At an earlier stage of the language before the rule of Nasal Elision was added to the grammar, the distribution of suffixation and infixation was probably as follows. If the root contained two morae and was thus long,

the suffix -st was added to the present tense stem in this derivational pattern. But if the root was short and contained only a single mora it underwent infixation. (This makes sense because infixation into roots with two mora would create an overlong three-morae root). Subsequently the Nasal Elision rulewas added to the grammar and roots of the third and fourth class lost the infix and compensatorily lengthened the root vowel.

Perhaps at this point these roots with derived long vowels were reinterpreted as belonging to class one, and hence underwent suffixation. Or if not this, perhaps they were felt to not be sufficiently characterized or marked for this derivational pattern, and hence underwent suffixation. Whatever the reason, we now seem to have the situation in which the fricative class verbs undergo both processes. The liquid class verbs ca be interpreted as behaving in the same fashion.

| | /šin-l-a/ | /šin-l-st-a/ |
|---|---|---|
| Nasal Elision | šii-l-a/ | /šii-l-st-a/ |
| Osthoff's Law | -------- | šil-st-a[4] |

## 2.5 The Present Tense

Traditionally, Lithuanian verbs are divided into three conjugations depending upon the vowel which ends the third person present form. An example of a first conjugation or a-stem verb is dìrbti 'work', which like many other verbs, occurs in both a reflexive and a non-reflexive form.

(30)

| | non-reflexive | | | reflexive | | |
|---|---|---|---|---|---|---|
| | sg. | dual | pl. | sg. | dual | pl. |
| 1 | dìrbu | dìrbava | dìrbame | dìrbuosi | dìrbavos | dìrbamės |
| 2 | dìrbi | dìrbata | dìrbate | dìrbiesi | dìrbatos | dìrbatės |
| 3 | dìrba | dìrba | dìrba | dìrbasi | dìrbasi | dìrbasi |

This verb is analyzed into four parts: a root dirb-; a present tense theme vowel a; person-number endings uo, ie, Ø, vo:, to:, me:, and te:; and finally an optional reflexive marker s(i).

All of the endings but the third person, which is the same in all numbers, show an alternation between the reflexive and the non-reflexive form, in which the latter either lacks a final vowel contained in the former, or else has a shortened counterpart of the reflexive's long tense final vowel. The analysis of the dual and plural endings is quite straightforward. In the dual the endings are basically /-va:/ and /-ta:/. When these morphemes are word final, their vowel is shortened; but if the reflexive marker follows, the vowel is tensed and raised to o:. Similarly, in the plural the endings are /-me:/ and /-te:/. When word final the e: is shortened, while in non-final position it is tensed to ė:. In the singular forms word final u and i alternate with the diphthongs uo and ie in the reflexive. Evidently the shortening of the underlying long vowels in the dual and plural and the loss of the final vowels of the diphthongs in the singular are part of the same process, and therefore constitute further evidence for representing the long vowels as geminate sequences in which the final member is truncated at the end of a word (Kenstowicz 1970a). Since the final a of the third person does not undergo this reduction, it is necessary to mark it as an exception. Presumably the retention of the a can be attributed to the fact that the thrid person ending was originally t as it is in Slavic and Indo-European generally. I will call the rule responsible for this reduction Final Shortening and formulate it as follows:

(Final Shortening) $V \rightarrow \emptyset \; / \; ___ \; \#$

This rule will of corse be ordered before Tensing.

The first and second person singular endings differ from the others in that the theme vowel does not appear before them; in addition, they are the only endings beginning with a vowel.[5] The absence of the theme vowel in these forms is accounted for by the following rule of Vowel Truncation which deletes the first vowel in a three vowel sequence.

(Vowel Truncation) V → Ø / ___ V V

| | /#dirb-a-ua#/ | /#dirb-a-ua-si#/ | /#dirb-a-ie#/ | /#dirb-a-ie-si#/ |
|---|---|---|---|---|
| V.T. | dirb-ua | dirb-ua-si | dirb-ie | dirb-ie-si |
| F.S. | dirb-u | ----------[6] | dirb-i | ----------[6] |
| a-Λ | _____ | dirb-uΛ-si | ------ | ---------- |

An example of a second conjugation or i stem verb is mýlėti 'love'.

(31)

| | non-reflexive | | | reflexive | | |
|---|---|---|---|---|---|---|
| | sg. | dual | pl. | sg. | dual | pl. |
| 1 | mýliu | mýliva | mýlime | mýliuosi | mýlivos | mýlimės |
| 2 | mýli | mýlita | mýlite | mýliesi | mýlitos | mýlitės |
| 3 | mýli | mýli | mýli | mýlisi | mýlisi | mýlisi |

This verb is analyzed as being of the same structure as dìrbti except that the theme vowel is i. The 1 and 2 sg. are derived as follows.

| | /#mi:l-i-ua#/ | /#mi:l-i-ie#/ |
|---|---|---|
| Glide | mi:l-j-ua | mi:l-j-ie |
| F.S. | mi:l-j-u | mi:l-j-i |
| Sharping | m'i:l'-j-u | m'i:l'-j-i |
| j-Ø | m'i:l'-u | m'i:l'-i |

To the third conjugation belong such verbs as matýti 'see' which is conjugated as follows.

(32)

| | non-reflexive | | | reflexive | | |
|---|---|---|---|---|---|---|
| | sg. | dual | pl. | sg. | dual | pl. |
| 1 | mataũ | mãtova | mãtome | mataũsi | mãtovos | mãtomės |
| 2 | mataĩ | mãtota | mãtote | mataĩsi | mãtotos | mãtotės |
| 3 | mãto | mãto | mãto | mãtosi | mãtosi | mãtosi |

Here the theme vowel is underlying a: which shows up as o: via the Tensing rule in the dual, plural, and the third person forms. The non-reflexive forms are derived straightforwardly by the rules already at our disposal:

| | /#mat-aa-ua#/ | /#mat-aa-ie#/ | /#mat-aa-mee#/ |
|---|---|---|---|
| V.T. | mat-a-ua | mat-a-ie | ---------- |
| F.S. | mat-a-u | mat-a-i | mat-aa-me |
| Tensing | ------- | ------- | mat-o-me |

However, these rules predict that the 1 and 2 sg. reflexive forms mataũsi and mataĩsi should exhibit derivations like the following:

| | /#mat-aa-ua-si#/ | /#mat-aa-ie-si#/ |
|---|---|---|
| V.T. | mat-a-ua-si | mat-a-ie-si |
| F.S. | ----------[6] | ----------[6] |

The low vowel components of the 1 and 2 sg. endings can be properly deleted if we "generalize" the Vowel Truncation rule to a "mirror image" rule:

(Vowel Truncation) $V \rightarrow \emptyset \; / \; V \; V$

ie.) $V \rightarrow \emptyset \; / \; __ \; V \; V$ 1)
$V \; V \; __$ 2)

| | /#mat-aa-ua-si#/ | /#mat-aa-ie-si#/ |
|---|---|---|
| $V.T._1$ | mat-a-ua-si | mat-a-ie-si |
| $V.T._2$ | mat-a-u-si | mat-a-i-si |
| F.S. | ---------- | ---------- |

## 2.6 The Past Tense

There are essentially only two kinds of past tense in Lithuanian. Once again the two different conjugations are named after the vowel which ends the third person form (either a: or e:).

The verb dìrbti falls into the first class and is conjugated as follows:

(33)

| | non-reflexive | | | reflexive | | |
|---|---|---|---|---|---|---|
| | sg. | dual | pl. | sg. | dual | pl. |
| 1 | dìrbau | dìrbova | dìrbome | dìrbausi | dìrbovos | dìrbomės |
| 2 | dìrbai | dìrbota | dìrbote | dìrbaisi | dìrbotos | dìrbotės |
| 3 | dìrbo | dìrbo | dìrbo | dìrbosi | dìrbosi | dìrbosi |

Since this conjugation is exactly the same as the present of matýti, it will be treated the same, and hence nothing more need be said about it.

As might be expected, verbs which have the a: theme in the present take the e: theme in the past tense.

(34)

| | non-reflexive | | | reflexive | | |
|---|---|---|---|---|---|---|
| | sg. | dual | pl. | sg. | dual | pl. |
| 1 | mačiaũ | mãtėva | mãtėme | mačiaũsi | mãtėvos | mãtemes |
| 2 | mateĩ | mãtėta | mãtėte | mateĩsi | mãtėtos | mãtetes |
| 3 | mãtė | mãtė | mãtė | mãtėsi | mãtėsi | mãtesi |

Again, the derivation of all forms but the 1 and 2 sg. follows straightforwardly from the analysis already given. The 1 sg. form mačiaũ shows a reflex of the sound change backing e to a before u, which was mentioned above in the discussion of bliáuti. Since all the other verbs forms we have treated so far can be derived from an underlying structure /root-theme-ending/, I do not wish to depart from such a structure here. Hence, I will indeed assume that there is a rule which backs e to a when followed by u. The words mačiaũ and mateĩ are derived as follows:

| | /#mat-ee-ua#/ | /#mat-ee-ie#/ |
|---|---|---|
| F.S. | mat-ee-u | mat-ee-i |
| V.T. | mat-e-u | mat-e-i |
| Sharping | mat'-e-u | mat'-e-i |
| Backing | mat'a-u | -------- |

A late rule, which I will call Softening, converts palatalized dental stops into palatal affricates when they stand before back vowels:

$$\text{(Softening)} \qquad [t', d'] \rightarrow [\check{c}, d\check{z}] \; / \; \underline{\quad} \; \underset{[+back]}{V}$$

By this rule /mat'-a-u/ be comes /mač-a-u/.

It is to be observed that the high vowel components of the 1 and 2 sg. endings also do not appear in the past tense of the reflexive verbs. Since all of the contexts in which these vowels do not appear are characterized by preceding long theme vowels, this strengthens the case for the mirror image expansion of Vowel Truncation. In this regard the reader will have noticed that in the derivation above of mačiaũ, the Final Shortening rule was applied before Truncation, while in the derivation of dìrbu Final Shortening applied after Truncation (dirb-a-ua → dirb-ua → dirb-u). The former ordering was necessary, because if Truncation applied first to /mat-ee-ua/, by the mirror image expansion, we would derive /mat-e-u/, to which Final Shortening would apply giving the incorrect /mate/. On the other hand, the latter ordering was needed for dìrbu since, from underlying /dirb-a-ua/, if Final Shortening were to apply first, the resultant /dirb-a-u/ could not undergo Truncation, yielding final-derived /dirbau/.

This difficulty can be obviated rather straightforwardly, however, by virtue of the fact that it is necessary to associate an underlying accent with the high vowel components of these endings. Hence, we may retain the ordering of Vowel Truncation precedes Final Shortening, by placing a restriction on the latter that it may not elide accented vowels. And such a restriction is not at all unnatural, but indeed might even be expected. Consequently, the Final Shortening rule will be revised to the following.

$$\text{(Final Shortening)} \qquad \underset{[-\text{ accent}]}{V} \rightarrow \emptyset \; / \; \underline{\quad} \; \#$$

The forms mačiaũ and dìrbu are now derived as follows.

| | /#mat-ee-ûa#/ | /#dírb-a-ûa#/ |
|---|---|---|
| V.T.$_1$ | mat-e-ûa | dírb-ûa |
| V.T.$_2$ | mat-e-ú | ------- |
| F.S. | ------- | dírb-ú |
| Sharping | mat'-e-ú | d'írb-ú |
| Backing | mat'-a-ú | ------- |
| Softening | mač'-a-ú | ------- |

A late rule deletes the accent from the ending in /dírb-ú/ to yield final derived /d'írbu/.

## 2.7 The Future Tense and the Imperative

The future tense is formed from the same stem alternant as the infinitive. It is characterized by the suffix -si plus the personal endings of the verb, with an optional reflexive marker -s(i). Thus, dìrbti is conjugated as follows in the future.

(35)

| | non-reflexive | | | reflexive | | |
|---|---|---|---|---|---|---|
| | sg. | dual | pl. | sg. | dual | pl. |
| 1 | dìrbsiu | dìrbsiva | dìrbsime | dìrbsiousi | dìrbsivos | dìrbsimės |
| 2 | dìrbsi | dìrbsita | dìrbsite | dìrbsiesi | dìrbsitos | dìrbsitės |
| 3 | dirbs | dirbs | dirbs | dirbsis | dirbsis | dirbsis |

The dual and plural are derived in the usual way. In the singular the derivations proceed as follows.

| | /#dirb-si-ua#/ | /#dirb-si-ie#/ | /#dirb-si#/ |
|---|---|---|---|
| Glide | dirb-sj-ua | dirb-sj-ie | ------- |
| V.T. | ---------- | ---------- | ------- |
| F.S. | dirb-sj-u | dirb-sj-i | dirb-s |
| Sharping | d'ir'b'-s'j-u | d'ir'b'-s'j-i | d'irb-s |
| j-Ø | d'ir'b'-s'-u | d'ir'b'-s'-i | ------- |

Unlike the present or past the future exhibits several alternations in the shape of the preceding stem. Most of these can be attributed to the fact that the suffix following the stem begins with the consonant s. Thus, in the future there is Assibilation (mèsiu from /met-si-u/); Metathesis drẽksiu from /drésk-si-u/); Palatal Leveling (nešiu from /nes̆-si-u/); Voicing Assimilation ([d'ir'p's'u] from /dirb-si-u/); Degemination (lèsiu from /les-si-u/); etc. The shift from acute to circumflex accent in the third person (cf. dìrbsiu, dir̃bs) is discussed in Kenstowicz 1970b.

The imperative is of the same constituent structure as the future, except that it occurs in basically thesecond person only. The imperative marker is -ki, the i being lost in the non-reflexive singular form via F.S.: dìrbk, dìrbkite, dìrbkis, dìrbkitės. The analysis readily accounts for these forms and so they require no further comment.

## 2.8 The Verbal Constituent Structure

In any non-derived Lithuanian verb four parts may be isolated. In order they are the root, the verb suffix (VS), the tense/aspect marker, and the personal endings. In addition, at the beginning of this string of morphemes an optional prefix may appear, and at the end an optional reflexive marker. The occurrence of these latter two elements of course depends upon the meaning of the verb in question. However, if both the prefix and the reflexive marker occur, the latter is moved into position between the prefix and the root. For example, the transitive verb kélti 'lift' has an intransitive reflexive counterpart ką́ltis 'get up'. To each of these verbs may be added the prefix at-, resulting in atkélti 'raise up' and atsikélti 'rise up'.

Each of these parts is assumed to be a reflexion of certain semantic and syntactic information of the verb, The only constituent requiring comment in this regard is the verb suffix. I assume this suffix to be a reflexion of the node or feature Verb, chiefly on the basis of the fact that when verbs are formed from nouns, some affix appears in this position, presumably as a reflexion of the rule forming the derived verb.

Since I have no evidence as to the structural relationship of these parts to one another in the surface syntactic structure, I will assume that they are merely conjoined by formative boundaries. Hopefully, investigation of derivational morphology and syntax will reveal more structure here. When there is a choice as to the particular phonological segments realizing these formatives, some of the alternants are predictable from information about the others. The phonological shape of the root is of course unpredictable, this information constituting part of the idiosyncratic or distinctive part of the lexical entry. In non-derived forms the same is basically true of the VS, which has four possible underlying forms: /∅/ dìrbti; /e:/ mylė́ti; /i:/ matýti; and /a:/ žinóti. On the other hand, the phonological character of the tense/aspect marker is by and large predictable from the information already specified. In fact, except for the present and past tense markers, all of these morphemes are of one basic shape: the future is -si, the infinitive -ti, the imperative -ki, etc. The same is true of the verbal endings.

The present tense marker has three possible underlying shapes: a, i, and a:, corresponding to the three conjugations. In the past only two occur--a: and e:. In most cases which particular alternant occurs is predictable from the VS. First, if the VS is -i:, then the present is -a: and the past is -e: (eg. matýti, mãto, mãtė.). Second, if the VS is -e:, the past will be -a:, but the present may be either -i or -a: (eg. mylė́ti, mýli. mýlėjo; kalbė́ti, kalba, kalbė́jo 'speak'). However, most of the latter are derived (cf, kalbà 'speech') and I will assume that the occurrence of -a as the present marker is predictable from the derivation pattern. Third, if the VS is -a:, then the past is -a:, and the present can be either -a: or -a (eg. žinóti, žìno, žinójo 'know'; vagóyi, vagója, vagójo 'furrow'). The latter may be cognate with Slavic -ãj VS as in the OCS čitati, čitajetŭ 'read'; and hence one might take the VS in Lithuanian here to be not -a:, but -a:j. We would then need a rule similar to the Slavic rule of "sonorant truncation"[7], in order to delete the j before consonant initial post stem suffixes. Perhaps one might go further and claim that the -ėj of kalbėjo is from -e:j (cf. OCS bělěti, bělějetŭ 'whiten'). However, the fact that -a:j shows up in the present vagójo,

while we have žìno (cf. OCS zĭnajetŭ) and kaĩba, rather than žinojo and kałbéjo, makes such an analysis difficult to maintain.

Finally, if the VS is Ø, the present will be -a and the past either -a: or -e:. However, a great many verbs in this class have a j augment in the present tense (eg. the ablauting verbs drẽbti, drẽbia, drẽbė; káuti, káuja, kóvė) and these verbs invariably take the -e: past. This might be grounds for taking the -e: to be a contraction of j-a:. However, forms like žinójo and vagójo, and kalbéjo and mylėjo seem to belie this approach. In any case the occurrence of the -e: past for most verbs with a Ø VS can be predicted on the basis of the j augment, whose occurrence in turn can be predicted on the basis of the fact that they are marked to undergo the minor rule of Ablaut which lengthens the root vowel in the non-present. Nevertheless, there remain a few verbs such as nẽšti, nẽša, nẽšė 'carry'; kàsti, kãsa, kãsė 'dig'; etc. for which the occurrence of the -e: past must be provided in the lexicon.

It is now necessary to specify the distribution of the VS. First, it always appears before consonant initial tesne/aspect markers, such as the infinitive: mylėti, matýti, žinóti, etc. Before the vowel initial present and past suffixes the VS sometimes appears and sometimes does not. In non-derived forms it does not appear in the present tense: mýli, mãto, žìno. In the past tense, the non-high VS (-e: and -a:) are retained and a j occurs between them and the following theme vowel: mylėjo, žinójo. But if the VS is a high vowel, then it does not occur in the past: mãtė.

The best way to treat these alternations in stem shapes, it seems to me, is to first formulate a rule of VS Truncation.

(VS Truncation) $\quad V \rightarrow \emptyset \; / \; \underline{\quad} + V$

verb suffix

In forms like mylėjo and žinójo the VS can be retained by another rule ordered before VS Truncation. This rule will insert a j between a non-high VS and a following past tense marker.

$$\emptyset \rightarrow j \; / \; \underset{\substack{[-\text{high}] \\ \text{verb} \\ \text{suffix}}}{V} ____ + \; \underset{[\text{past}]}{V}$$

These rules are ordered to apply before the regular phonological rules and merely function to adjust the verb stem to the shape required by the regular rules. Aside from the generalization that the VS does not occur before a vowel, there is little insight that they provide, and hence I would be reluctant to defend this treatment very vigorously. It might be thought that on the basis of the work of Halle and Lightner[8] on Slavic, that a structure of the form /root-VS-theme-ending/ could be shown to more directly underlie the Lithuanian verbs. Although in Slavic such a structure can be shown to have important consequences for the phenomena of accentuation and transitive softening, I have been unable to find any comparable evidence from Lithuanian which would justify a similar treatment.

Section 2 Footnotes

1. Historically these vocalisms arise from falling diphthongs: ai, ei → ie; ō → cu → uo via metathesis. In the present-day language there are still alternations reflecting these sound changes, both paradigmatic (see 2.3) and derivational: cf. sniegas 'snow', snaigė 'snowflake'. However, the conditions under which these alternations take place are largely unpredictable.

2. This is a synchronic reflex of a sound change known as Osthoff's Law.

3. For an interesting discussion of the resonants see Bailey (1968).

4. The acute rather than circumflex accent in šìlsta (recall that orthographically an acute diphthong with a high vowel is represented with the grave accent) can be explained if Kiparsky's (1972) interpretation of the Lithuanian accents is accepted. According to this proposal there is a "tone spreading" rule (cf. Halle (1971))such that all morae preceding the underlying accented morae are accented. The opposition between circumflex CāC versus acute CáC (where CaC represents any syllable with a long vowel or diphthong) is one of accent on the final mora of the accented syllable versus no accent on the final mora of the accented syllable: CáāC versus CāaC. The forms sỹla and šìlsta are now derived as follows:

| | / ši-ń-l-a/ | / ši-ń-l-st-a / |
|---|---|---|
| NE | šiíla | šiílsta |
| TS | šííla | šíílsta |
| OL | ----- | šílsta |

5. In the earlier version of this work (Kenstowicz 1971) I had proposed to derive the 1 and 2 sg. endings from underlying falling diphthongs by a generalized Metathesis rule: au, ei → ua, ie. However, as Hans Hock has pointed out to me, if the Glide rule is restricted to operate only across morpheme boundaries, this is unnecessary and the underlying representation of these endings can be ua and ie.

6. The reason for the blockage of Final Shortening here is not obvious, especially since the rule does apply in the dual and plural. However, as we shall see in Section 3, it is necessary to posit a rule (Leskien's Law) which elides an unaccented one mora vowel when preceded by an accented mora in the context __ (s) . Note that the 1 and 2 sg. endings are acute diphthongs, and hence would be subject to this further reduction. Perhaps the lack of Final Shortening in these environments can be attributed to the desire to protect these endings from further reduction.

7. Jakobson (1948).

8. Halle (1963) and Lightner (1967).

# 3. NOMINAL ACCENTUATION

## 3.1 The Accentual Unit

Phonetically, Lithuanian is like Russian in that generally speaking there is only one accent per word. But unlike Russian, Lithuanian has three kinds of accent: a falling accent (indicated by the acute), a rising accent (indicated by the circumflex), and a simple `raised` accent (indicated by the grave accent sign). However, the distribution of these accents is quite restricted. First, the contour accents, ie. the acute and circumflex, only fall on long syllables. There are two kinds of long syllables in Lithuanian. 1) a syllable is long if it contains a long vowel: eg. matýti inf., matỹs 3 fut. 'see'; myliėti inf., mylės 3 fut. 'love'. 2) a syllable is long if it contains a diphthon diphthong. There are two kinds of diphthongs in Lithuanian. A) vocalic diphthongs, which are defined as high vowels immediately adjacent to non-high vowels: eg. káimas 'village', vaĩkas 'child', dúoti inf., duõs 3 fut. 'give'. B) mixed diphthongs, which are vowels immediately followed by liquids or nasals in closed syllables: eg. kártis 'pole', kartis 'bitterness', ántis 'duck', antis 'breast'. The second distributional constraint on the accents is that the grave accent only falls on short syllables, ie. syllables with a short vowel which is not part of a diphthong: eg. bitė̀ 'bee', mùsė̀ 'fly', pìna 3 present 'plait'. Because of the Secondary Lengthening rule, the grave accent typically occurs on high vowels, unless in a final syllable, where it may occur on non-high vowels: rankà nom. sg., rankojè loc. sg. 'hand'

From these distributional constraints, the following generalization emerge. If a syllable is long and accented, it will have a contour accent, and if a syllable has a contour accent, then that syllable will be long; similarly, if a syllable is short and accented, the accent will be of the non-contour type, and if a syllable carries a non-contour accent, then the syllable will be short. It follows from this that when the acute and circumflex accent signs occur over vowels which are not members of diphthongs, these accented vowels must be long.

These distributional regularities will fall out automatically if a mora notation is introduced for representing the accent. A long syllable will contain two morae, and acute and circumflex can then be defined as a binary opposition between accent on the initial and final mora of a long syllable, where accent is realized phonetically as high pitch. The grave accent is also interpreted as a realization of high pitch, but I assume that no contour is perceived, because there are no adjacent sonorous elements in the same syllable.

The mora will be defined as follows. Given a string of syllabified segments in which long vowels are represented as sequences of identical vowels, the first vowel in the syllable is specified as a mora as well as an immediately following vowel, or liquid or nasal provided the latter are in a closed syllable. Thus, *matýti* and *matỹs* are represented as /*mat*$\overset{+}{\underline{i}}$*i*$\underline{t}$*i*$\underline{t}$*i*/ and /*mat*$\overset{+}{\underline{i}}$*i*$\underline{s}$/, where the underlining indicates morae and the + indicates accent (= high pitch). Similarly, *kâimas*, *vaĩkas*, *ántis*, and *añtis* are represented as /*k*$\overset{+}{\underline{a}}$*i*$\underline{m}$*a*$\underline{s}$/, /*v*$\overset{+}{\underline{a}}$*i*$\underline{k}$*a*$\underline{s}$/, /$\overset{+}{\underline{a}}$*n*$\underline{t}$*i*$\underline{s}$/ and /*a*$\overset{+}{\underline{n}}$*t*$\underline{i}$*s*/ before Secondary Lengthening has applied, but after this rule the acutes are lengthened to /*k*$\overset{++}{\underline{aa}}$*i*$\underline{m}$*a*$\underline{s}$/ and /$\overset{++}{\underline{aa}}$*n*$\underline{t}$*i*$\underline{s}$/.

Thus, the mora is the accentual unit and Lithuanian is a "mora language".[1] A priori, however, there is no reason to expect the accentual unit to be the same in all parts of the grammar, especially since during the history of a language it can change from a mora to a syllable notation as in Greek, or from a syllable to a mora notation as in Lithuanian.[2] As the analysis develops, we will see that it may be necessary to operate with both syllables and morae in Lithuanian.

## 3.2. The Traditional Analysis

Traditionally, Lithuanian nouns have been divided into four accent classes.[3] Examples for the two main declensions follow.

(38) Feminine a-stems.

| Sg. | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| N | várna | rankà 'hand' | galvà 'head' | kalbà 'speech' |
| G | várnos | rañkos | galvõs | kalbõs |
| D | várnai | rañkai | gálvai | kalbai |
| A | várną | rañkę | gálvą | kalbą |
| I | várna | rankà | gálva | kalbà |
| L | várnoje | rañkoje | galvojè | kalbojè |
| V | várna | rañka | gálva | kalba |
| Dl. | | | | |
| NAV | várni | rankì | gálvi | kalbì |
| D | várnom | rañkom | galvóm | kalbóm |
| I | várnom | rañkom | galvõm | kalbõm |
| Pl. | | | | |
| N | várnos | rañkos | gálvos | kalbos |
| G | várnų | rañkų | galvų̃ | kalbų̃ |
| D | várnoms | rañkoms | galvóms | kalbóms |
| A | várnas | rankàs | gálvas | kalbàs |
| I | várnomis | rañkomis | galvomìs | kalbomìs |
| L | várnose | rañkose | galvosè | kalbosè |
| V | várnos | rañkos | gálvos | kalbos |

Other examples:

1. anýta 'mother-in-law', ãšara 'tear', elgeta 'beggar'.
2. arbatà (voc. arbãta) 'tea', lelijà (lelija) 'lily', kulkà (kulka) 'bullet', bibliotekà (bibliotèka) 'library'.
3. Lietuvà (lietuva) 'Lithuania', burnà (búrna) 'mouth', pamokà (pãmoka) 'lesson', karvenà (kárvena) 'cowhide'.
4. ligà (liga) 'illness', gamtà (gamta) 'nature', lazdà (lãzda) 'stick'.

(39) Masculine o-stems

| | | | | |
|---|---|---|---|---|
| Sg. | | | | |
| N | káimas 'village' | rãtas 'wheel' | lángas 'window' | vaĩkas 'child' |
| G | káimo | rãto | lángo | vaĩko |
| D | káimui | rãtui | lángui | vaĩkui |
| A | káimą | rãtą | lángą | vaĩką |
| I | káimu | ratù | lángu | vaikù |
| L | káime | ratè | langè | vaikè |
| V | káime | rãte | lánge | vaĩke |
| Dl. | | | | |
| NAV | káimu | ratù | lángu | vaikù |
| D | káimam | rãtam | langám | vaikám |
| I | káimam | rãtam | langaĩ̃m | vaikaĩ̃m |
| Pl. | | | | |
| N | káimai | rãtai | langaĩ | vaikaĩ |
| G | káimų | rãtų | langų̃ | vaikų̃ |
| D | káimams | rãtams | langáms | vaikáms |
| A | káimus | ratùs | lángus | vaikùs |
| I | káimais | rãtais | langaĩs | vaikaĩs |
| L | káimuose | rãtuose | languosè | vaikuosè |
| V | káimai | rãtai | langaĩ | vaikaĩ |

Other examples

1. vandenýnas 'ocean', kóvas 'March', kúlėjas 'thresher', rántas 'nitch'.
2. pieštùkas 'pencil', graĩ̃dras 'stork', mẽtas 'time', universitètas 'university'.
3. kálnas 'mountain', vãrkaras 'evening', ẽzaras 'lake', giñtaras 'amber',
4. viĩkas 'wolf', stiklas 'glass', lẽdas 'ice', vaĩ̃das 'name'.

This system of classification is rather elegant in its own right and quite practical. It is used in textbooks, traditional grammars, and dictionaries. In general, it permits one to predict the superficially

complicated accentual pattern of an entire paradigm on the basis of just one form and its associated class marker. This is because in all forms of the paradigm the stem is always accented in the same way, and each ending is always accented the same, regardless of the shape of the preceding stem. Thus, the accentual interplay is between the stem and the ending, and to decline a given noun correctly is just a matter of knowing for the combination of a given stem and ending, whether the underlying stem or desinential accent becomes the word accent. And the latter information is provided by the class marker.

The linguistically significant distributional properties which define membership in this taxonomy are as follows.

(40) 1 a. The accent falls on the same mora of the stem throughout the paradigm; i.e. the ending is never accented.

b. The accent may fall on any mora of the stem except the last.

2 a. The accent is basically on the stem.

b. When the ending is accented, the accent is grave.

c. If the stem is accented, the accent falls on the last mora.

3 a. The accent is basically on the ending.

b. When the stem is accented, the accent falls on the first syllable.

c. The last mora of the stem is never accented. Thus, if an accented stem of this class is monosyllabic, the accent will be acute.

4 a. The accent is basically on the ending.

b. When the stem is accented, the accent falls on the first syllable.

c. If the stem is accented, the accent falls on the last mora of the stem. Thus, stems of this class are monosyllabic.

There are two main reasons why the traditional analysis cannot be accepted as a plausable linguistic description of accentuation in Lithuanian nominals. First, if the accentual pattern of a given noun were an arbitrary feature of each noun, as essentially is claimed by the class markers 1-4, then there would be no reason to expect generali-

zations like those in (40) to be possible. Rather, the existence of such generalizations suggests that the accentual patter of a noun is governed by the accentual shape of its constituents and not some arbitrary non-phonetic information. Second, by inspection of the paradigms it can be determined that if a noun of class 2 is accented on the desinence, then a corresponding noun of class 4 will also be; and likewise, if a class 3 noun is end accented, then the corresponding class 4 noun will be also. It is the lack of explanation for facts such as these which leads to a rejection of the traditional analysis as being an adequate description of the structure of the Lithuanian accentual system. For, by merely arranging the data in such a way that questions about underlying regularities can be raised (no easy task in itself), the traditional analysis only goes part of the way towards an adequate description, since it provides no reasons for why the data should appear in the way they do, rather than in some other way. In other words, it lacks explanatory power.

### 3.3. Heeschen's Analysis

An attempt at an explanation of the Lithuanian accent system has been made by Heeschen (1967). Although I think that this analysis is fundamentally in error, it is nevertheless interesting in the approach it takes and deserves to be discussed in some detail.

The analysis basically constitutes an incorporation of the traditional taxonomy into a generative description, and therefore can be expected to be subject to some of the same criticisms. In Heeschen's analysis stems are categorized into four classes in the lexicon, corresponding to the four accent classes of the traditional taxonomy, by means of two morpheme features, Strong Susceptible (SS) and Post Stem (PS)

(41)

| Class | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| SS | - | - | + | + |
| PS | - | + | - | + |

In addition, the nominal endings are classified into two groups by the morpheme feature Strong.

In this analysis there is no underlying feature of accent. Rather accent is assigned to the stems and endings by phonological rules operating on the basis of the lexical specifications for the three morpheme features. There are four such rules.

(42) A. Accent the second mora of stems which are -PS, i.e. classes 1 and 3.

B. Accent the mora immediately following the stem in +PS stems, i.e. classes 2 and 4.

C. Retract the accent by one mora.

D. If the stem is +SS and the ending +Strong, accent the last mora of the ending.

The forms káimas, rãtas, lángas, and vaĩkas are derived as follows.

| | /kaim+as/ | /rat+as/ | /lang+as/ | /vaik+as/ |
|---|---|---|---|---|
| | -PS -ST | +PS -ST | -PS -ST | +PS -ST |
| | -SS | -SS | +SS | +SS |
| A. | kaĩm+as | -------- | lãng+as | -------- |
| B. | -------- | rat+ãs | -------- | vaik+ãs |
| C. | káim+as | rãt+as | láng+as | vaĩk+as |
| D. | -------- | -------- | -------- | -------- |

In the nom. pl., where the ending is +Strong, the derivations are the same up to rule D.

| | | | | |
|---|---|---|---|---|
| C. | káim+ai | rãt+ai | láng+ai | vaĩk+ai |
| D. | -------- | -------- | lang+aĩ | vaik+aĩ |

Cases like the instr. sg., where the even classes are end accented but the odd ones are not, are treated by marking these endings as exceptions to the retraction rule C.

| | | | | |
|---|---|---|---|---|
| B. | kaĩm+u | rat+ũ | lãng+u | vaik+ũ |
| C. | káim+u | -------- | láng+u | -------- |

There are several fundamental criticisms to be made against this analysis. First, for some reason it was limited to monosyllabic stems.

This limitation distorts, rather than reveals the underlying structure of the accentual system. For when longer stems are considered, it becomes apparent that the analysis cannot be extended in any natural way to account for the accentuation of stems in class 1. It will be recalled that these stems can have accent falling on any mora but the last, while Heeschen's analysis predicts that the accent will always fall on the first, which is the case only when the stems are monosyllabic.

Secondly, the analysis fails to show in any natural way why, for example, classes 2 and 4 behave alike in some respects versus 1 and 3, while in others, it is classes 3 and 4 which parallel one another as opposed to 1 and 2. Rather this parallel behavior is in effect taken to be a basic datum that cannot be explained, but is merely described by giving a name to those elements which behave alike, claiming that the parallel behavior is unmotivated and accidental in that there is no reason why some other grouping of the data should not be expected. This of course is the same criticism directed against the traditional analysis, which should not be surprising as the analysis is essentially an incorporation of the traditional description. Of course this is exactly the correct approach to take in cases where the phonetic properties which morphemes have cannot in any reasonable way be shown to be responsible for their behavior in alternations, etc. In such cases the person learning the language must simply memorize and associate an arbitrary marker with the morphemes, since their behavior is not determined by any other phonetic properties the morpheme has. But it has been a fundamental assumption of generative phonology and traditional morphophonemics that much of the phonological behavior of a morpheme is determined by the essentially phonetic character of its underlying form. Hence, if we can show that the accentual behavior of Lithuanian nouns can be explained by natural rules motivated by the underlying phonetic properties of the morphemes, then we have a strong argument against the approach taken in Heeschen's analysis.

There is one more fundamental criticism that can be leveled against the approach adopted in this analysis. Notice that what has been done is

to first categorize morphemes by means of morpheme features for the phonological feature of accent, and then to predict the occurrence of this feature by phonological rules which are conditioned by the morpheme features. The error in this approach can perhaps best be seen by comparing it to a parallel example in another area. We have seen that there are essentially four underlying vowel phonemes in Lithuanian, each occurring in long and short pairs. These four phonemes are defined by two basic contrasts: +/- high and +/- back. Following the approach of Heeschen's analysis, we could eliminate specifications for the phonological feature of vowel height and gravity in the underlying representations and predict their occurrence by phonological rules, which would, of course, have to be conditioned by morpheme features, say High and Back. No one, of course, would ever seriously propose such a description, the reason being that it involves a trivial simplification and makes the false claim that the occurrence of vowel quality is predictable in an interesting and linguistically significant way, when in fact it is not. Similarly, Heeschen's analysis appears to claim that stem accentuation is predictable by rule when it actually is not, which is shown by the fact that the properties which trigger the rules "predicting" the stem accentuation are nothing but categorizations of stem accentuation in the first place. Of course these morpheme features do play a role in defining the various accentual patterns. But this only shows that the accentual shape of the stem is involved in a prediction of the patterns, and not that it itself is predictable.

In what follows I will try to show what by considering all stems and not just those which are monosyllabic, and by specifying what is unpredictable in the underlying forms, the structure of the Lithuanian accent system can be better revealed. More specifically, I shall claim that the accentual shape of the Lithuanian nominal is governed in a rather natural way by certain phonological rules operating upon the accentual shape of the underlying stems and endings.

3.4. Leskien's Law

Before we can turn to a discussion of nominal accentuation, it will be necessary to say a few words about the nominal desinences. The endings which appear on the masculine o-stem nouns, with very few exceptions, also occur in the masculine adjectives, while the feminine a-stem desinences appear in the declension of the feminine adjectives. Adjectives occur in two forms in Lithuanian: a short form and a long form, the latter being composed of the short form plus a pronominal element, which in turn is complex, having as constituents a root /i-j/, plus the same desinences of the short form. For example, the following are the declensions for the long and short forms of the adjective meaning 'good'.

(43)

| | Masculine | | Feminine | |
|---|---|---|---|---|
| | short | long | short | long |
| Sg. | | | | |
| N | gẽras | geràsis | gerà | gerój̨i |
| G | gẽro | gẽrojo | gerõs | gerõsios |
| D | gerám | gerájam | gẽrai | gẽrajai |
| A | gẽrą | gẽrąjį | gẽrą | gẽrąją |
| I | gerù | gerúoju | gerà | gerą̃ja |
| L | geramè | gerãjame | gerojè | gerõjoje |
| Dl. | | | | |
| NA | gerù | gerúoju | gerì | gerí̃eji |
| DL | geríem | geríejiem | geróm | gerójom |
| I | geriẽm | geríejiem | gerõm | gerõjom |
| Pl. | | | | |
| N | gerì | geríeji | gẽros | gẽrosios |
| G | gerų̃ | gerų̃jų | gerų̃ | gerų̃jų |
| D | geríems | geríesiems | geróms | gerósioms |
| A | gerùs | gerúosius | geràs | gerą̃sias |
| I | geraĩs | geraĩsiais | geromis | gerõsiomis |
| L | geruosè | geruõsiuose | gerosè | gerõsiose |

Observe that in certain cases the ending of the short form, which appears word finally, is reduced in comparison with the same ending in the long form, which is protected from word final position by the pronominal element.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| (44) | I sg. masc. | gerù | gerúoju | N sg. fem. | gerà | geróji |
| | N dl. masc. | gerù | gerúoju | I sg. fem. | gerà | gerą́ja |
| | N pl. masc. | gerì | geríeji | N dl. fem. | gerì | geríeji |
| | A pl. masc. | gerùs | gerúosius | A pl. fem. | gerà̀s | gerą́sias |

Here we see that the alternation involves a short vowel or truncated diphthong alternating with the corresponding long vowel or full diphthong. Furthermore, each of these syllables are distinguished from the rest by having acute accentuation. Since long vowels shorten and diphthongs undergo loss of their final components in exactly the same conditions, we are forced to represent long vowels sequentially and shorten them in final position by a rule which will be called Leskien's Law.[4]

(Leskien's Law) $V \longrightarrow \phi \;/\; \overset{+}{\acute{V}} ___ (s) \#$

Thus, for example, /-$\overset{+}{\acute{u}}$os/ → /-$\overset{+}{\acute{u}}$s/, /-$\overset{+}{\acute{a}}$as/ → /-$\overset{+}{\acute{a}}$s/, etc., where of course the grave accent on the shortened acute follows automatically from the mora representation.

A few more comments about these endings. The nom. sg. fem. is underlyingly /-$\overset{+}{\acute{a}}$a/ which undergoes Leskien's Law to /-$\overset{+}{\acute{a}}$/ when in final position, and is tensed to /-$\overset{+}{\acute{o}}$o/ when not final. Hence, the Tensing rule must be ordered after Leskien's Law. The ins. sg. and acc. pl. fem. also have the underlying vocalism /-$\overset{+}{\acute{a}}$a/, but in addition have to be marked as exceptions to Tensing. The historical explanation for the lack of tensing to o: here is that these vowels were originally followed by nasals and as we know Tensing does not apply to the reflexes of formerly nasalized vowels. However, there is no synchronic evidence within Lithuanian for setting up these endings with nasals, and I therefore will treat them as simply being exceptions to the Tensing rule. The locative ending -è is probably from an underlying particle /-en/, which shows up in the plural adessive (formed from the loc. plus a postposition): drauguosè, drauguosempi.

3.5. de Saussure's Law

In this section I discuss the parallel behavior of the odd and even numbered accentual classes of the traditional taxonomy. The principles underlying this parallel behavior are disclosed by consideration of the following two distributional properties of the accent. First, it will be recalled, when the stem is accented, the accent is in complementary distribution between the odd and even numbered classes in the following respect. In the even classes the accent falls on the last mora of the stem, while in the odd classes it may not. Second, examination of the endings where classes 2 and 4 are end accented, reveals that they are underlying acutes, which are shortened to graves word finally by Leskien's Law.

(45) Masculine

| | | | | | | |
|---|---|---|---|---|---|---|
| instr. sg. | káimu | ratù | lángu | vaikù | cf. | gerúoju |
| loc. sg. | káime | ratè | langè | vaikè | | |
| nom. dl. | káimu | ratù | lángu | vaikù | | gerúoju |
| acc. pl. | káimus | ratùs | lángus | vaikùs | | gerúosius |

Feminine

| | | | | | | |
|---|---|---|---|---|---|---|
| nom. sg. | várna | rankã | galvà | kalbà | cf. | gerój̃i |
| instr. sg. | várna | rankà | gálva | kalbà | | gerą̃ja |
| nom. dl. | várni | rankì | gálvi | kalbì | | geríejí |
| acc. pl. | várnas | rankàs | gálvas | kalbàs | | gerą̃sias |

Putting together these facts about the accentuation of the stems and endings suggests the following analysis. All the stems are accented in the underlying form as they appear on the surface in those cases like the vocative, where the stem accent is the word accent. Furthermore, these endings are analyzed as underlying acutes, which are shortened word finally by Leskien's Law. Finally, the "attraction" of the ictus to the endings is governed by the following rule.[5]

(de Saussure's Law) $\overset{+}{M} \longrightarrow M \; / \; ___ \; \overset{+}{M}$

That is, a dissimilation rule according to which the first of two contiguously high-pitched morae becomes non-high-pitched. Thus, for example, káimu, ratù, lángu, and vaikù are derived as follows.

| | /kaim+uo#/ | /rat+uo#/ | /lang+uo#/ | /vaik+uo#/ |
|---|---|---|---|---|
| de Saussure's Law | -------- | rat+uo# | -------- | vaik+uo# |
| Leskien's Law | kaim+u# | rat+u# | lang+u# | vaik+u# |

In order to account for the stem accentuation in the odd numbered forms here it is necessary to formulate another rule, which, following Coats (1970), I will call Accent Adjustment. This rule will delete high pitch from all but the first accented mora of a word and will have to be ordered after de Saussure's Law and Leskien's Law.

(Accent Adjustment) $\dot{M}_1 \dashrightarrow M \;/\; \#\ X\ \dot{M}\ ___\ \#$ (where X does not contain $\dot{M}$

This rule then yields final derived: /kaimu/, /ratu/, /langu/, and /vaiku/.

Notice that instead of having to treat this attraction of the ictus to the desinences in these cases as exceptional (as in Heeschen's analysis), this superficial complexity of the accent system can be attributed to the operation of a quite characteristic property of human language, dissimilation of contiguous high pitches. What makes Heeschen's treatment even more implausable is that de Saussure's Law also operates in verbs. In fact, with the exception of the dative dual and plural desinences, I know of no cases in which an underlying acute which is conjoined to a preceding grave or circumflex syllable fails to dissimilate the preceding accent. Hence there is nothing really exceptional about such attraction of the accent at all, as Heeschen's treatment would have us believe.

Notice in addition that the rule of de Saussure's Law also strongly corroborates our initial hypothesis that the mora notation is required for the representation of accent in Lithuanian. Originally, such a proposal was based on purely distributional factors such as the fact that contour accents only occurred on long syllables and non-contour accents only on short syllables. Here we see that by employing the mora notation we can attribute the parallel behavior of classes 2 and 4 versus 1 and 3 to the characteristic phenomenon of dissimilation.

Hence we can now reduce the number of accent classes in the traditional taxonomy by two. Instead of four classes we now have two

plus a general phonological rule: the immobiles (1 and 2), where the accent is basically on the stem; and the mobiles (3 and 4), where the accent alternates between the initial and final positions in the word.

Before proceeding further with the description, let us note a couple of difficulties. First, we must still account for the desinential accent in the class 3 forms in the nom. sg. fem. galvà and the loc. sg. masc. langè. This problem will be discussed in the next section. Second, there is the fact that, although superficially acute, the dative dual and plural endings still fail to attract the accent from a preceding class 2 stem: rãtam, rãtams, rañkom, rañkoms. Note that in the feminine these endings are peculiar in another respect, in that we have a reflex of a long vowel--the o: --followed by a resonant in a closed syllable, and hence contrary to Osthoff's Law. The historical explanation for these forms is that originally the ending was of the shape /-Vmus/. This vowel was lost for some reason and the preceding syllable became acute and failed to shorten by Osthoff's Law. Since I know of no independent evidence for setting up an underlying shape /-Vmus/, I will simply mark these endings as exceptions to the environment of de Saussure's Law.

3.6. The Mobile - Immobile Contrast

On the basis of de Saussure's Law we have reduced the number of accent classes in the traditional taxonomy to two. It is now necessary to inquire whether the accentual behavior of the mobiles versus the immobiles is just an arbitrary property of each stem which must be memorized ad hoc for each stem when learning the language, or whether the accentual behavior follows from some independent phonological properties of the two classes of stems. We recall that the immobiles have the property that the accent can fall on any mora and hence any syllable of the stem, while the accent is limited to the initial syllable of the stem in the mobile class. This immediately suggests the following explanation for the difference in mobility. Since in the immobile class the accent can fall on any mora of the stem, it is necessary to include this information in the lexical representations of these

morphemes. On the other hand, the mobiles can be treated as being basically unaccented stems, since when their stems are accented, the accent predictably falls on the first syllable. Hence, to account for the mobility of classes 3 and 4 versus 1 and 2 we just have to say that certain desinences are accented and certain others accentless. When a mobile (accentless) stem is combined with an accented desinence, the desinential accent becomes the word accent. When such an accented desinence is combined with an immobile (accented) stem, the rule of Accent Adjustment will apply to make the stem accent the word accent. Finally, when an unaccented stem is combined with an unaccented ending, we will have a rule of Accent Insertion which will insert accent on the initial syllable of an accentless word.

This, I claim, is the basis for the mobility versus immobility of accent in Lithuanian. Of course, such an analysis should not be too surprising, as it is essentially what underlies the mobility of accent in Slavic.[6] Furthermore, such a contrast between accented and unaccented stems/morphemes is quite typical, being found in languages as diverse as Japanese and Cupan.[7]

Hence, if this treatment can be made to work, we will have reduced the number of accent classes in the traditional taxonomy to null and will be able to explain the accentual behavior of the four types of stems quite straightforwardly in terms of two underlying accentual contrasts in the shapes of the stems, and several quite natural phonological rules. That is, there will be a contrast between accented and unaccented stems and the rules of Accent Insertion and Accent Adjustment, which will explain the Mobile - Immobile contrast; and second, the contrast between accent on the final versus non-final mora of the stem and the rule of de Saussure's Law.

However, despite the naturalness and inherent elegance of such an analysis, there are several difficulties in making it viable for Lithuanian. Essentially, these difficulties center around the representation of accent in terms of which the mobile - immobile contrast is to be treated. For purposes of discussion, I will delimit the types

of accent that can be found in the initial syllable of mobile nouns in the following array.

(46) A. acute diphthongs: pìlnas 'full', dáigas 'germ'.
B. circumflex diphthongs: vilkas 'wolf', vaĩkas 'child'.
C. long acute vowels: tḗvas 'father' , óras 'weather'.
D. (underlying) short circumflex and grave vowels: lẽdas, 'ice', nãmas 'house', stĩklas 'glass'.
E. long circumflex vowels: jėgà (jẽgą) 'strength', kovà (kõvą) 'battle'.

On the basis of these data it would appear that we cannot predict what sort of accent (rising or falling) a syllable will have and hence would be forced to mark these forms for accent in the underlying representation. But in order for the explanation of mobility of these forms in terms of accentless stems to go through, it would appear that we must consider their accent to be inserted and hence predictable by a rule.

At this point I think it would be useful to say something about the historical antecedents of the present Lithuanian accents. Originally, the Lithuanian acute can be seen quite clearly to be the descendent of accent on a long vowel, and the circumflex and grave to be reflexes of accent on short vowels. However, later sound changes and derivational processes have obscured this. Thus, pìlnas originally contained a long vowel which became shortened by Osthoff's Law and hence fell together in length with vilkas, the accent becoming the superficial differentiating factor. Likewise, the a of dáigas is the reflex of a long vowel which became shortened by Vowel Truncation and hence assumed the same surface length as a form like vaĩkas. Similarly, the difference between the C and D forms was and, given our analysis, still is the fact that the C forms like tḗvas contain underlying long vowels, while the D forms like lẽdas have basic short vowels which are lengthened secondarily. Finally, in the present-day language one does find a great number of forms with circumflex accent and reflexes of underlying long vowels. However, historically at least, most of these forms are derived: for

example, sėkmẽ (sėkmę) 'consequence' from sèkti 'follow'; sėjà (sėją) 'planting time' from sė́ti 'sow'; kovà (kõvą) from káuti 'beat'.

At least historically then, the contrast of rising and falling was predictable in terms of an underlying length contrast. For purposes of the following discussion I will assume that such a predication is also possible synchronically. Thus, I will assume that the underlying representation for vỹlnas is /pi:ln-/, for vil̃kas is /vilk-/, for dáigas is /da:ig-/, and for vaĩkas is /vaik-/. In addition, of course, we are assuming that tė́vas and óras contain underlying long vowels contrasting with forms like lẽdas and nãmas which contain underlying short vowels lengthened by the rule of Secondary Lengthening. Finally, I will assume the long vowels and circumflex accent in forms such as those in E can be predicted from the derivational pattern. (As the analysis develops we shall see that these assumptions do not necessarily have to be made in order for the distinction between mobile and immobile paradigms to be explained in a satisfactory way.)

Now having made this assumption about an underlying length contrast, let us see how the accent insertion rule for the mobile stems is to be formulated. It will immediately be noticed that the relevant generalization is to place accent on the initial syllable or vowel of the word and not to assign the accent directly in terms of morae. Thus, given /pi:ln/ and /vilk-/ if we were to assign the accent in terms of morae, in order to get accent on the initial mora of the former and on the final of the latter we would need rules of assignment like the following: "in an unaccented word, assign accent to the initial mora of the first syllable if the first syllable contains a long vowel; but if the initial syllable contains a short vowel, assign accent to the final mora of the initial syllable." Notice first that each rule of assignment depends crucially on the notion syllable and secondly that the relevant generalization is that accent is limited to the first syllable. Hence, this strongly suggests that at this level of analysis, where the distinction between the mobile and immobile stems is to be made, the accentual unit is the syllable and not the mora.[8] In addition, it suggests that

what gets inserted here and called accent is really stress and not high pitch. (As will be shown below, the assumption that the mobile - immobile distinction is defined in terms of stress enables one to give a plausable account of the accentuation in forms like galvà and langè.)

Hence, I will assume that the contrast between the mobile and immobile stem types is defined in terms of the feature stress. Immobile stems will now be analyzed as being stressed in underlying representations and mobiles will be stressless. When the latter are combined with a stressless ending, a rule of Stress Assignment will apply to insert stress on the initial syllable of stressless words. Thus I am assuming that at the deepest level of analysis we have two prosodic features in Lithuanian--length and stress--and that the superficial features of rising and falling tones are derived by phonological rules which operate in terms of these two basic underlying features of length and stress. It is to a discussion of these rules that we now must turn.

At this point essentially two different approaches are available for converting the features of length and stress into a system with rising and falling tones. I will sketch first an approach which I proposed in an earlier version of this thesis and which I now think to be, if not inadequate, at least questionable.

According to this approach, after the stress has been assigned by the Stress Insertion rule, it is necessary to convert into a mora representation before the rules of Vowel Truncation, Osthoff's Law, Secondary Lengthening, etc. neutralize the underlying length contrasts in terms of which the rising and falling tones are to be predicted. Given a form like /pi:ln+as/ and a form like /vilk+as/ (we use the symbol x to designate stress, retaining + for high pitch), what we require is a rule to place high pitch on the initial mora of the first syllable of the former and on the final mora of the initial syllable of the latter. A similar treatment is required for /ka:im+as/, /da:ig+as/, /vaik+as/, and /rat+as/. This can be done by a rule of the following form, which I will call Mora Assignment.

(Mora Assignment) Place high pitch on the first mora of a stressed syllable containing a long vowel, and on the last mora of a syllable containing a short vowel.

Thus, at this point the grammar converts from a syllable to a mora representation.

(47)

| | | |
|---|---|---|
| pí:ln+as | ---→ | píiln+as |
| vílk+as | ---→ | víik+as |
| ká:im+as | ---→ | káaim+as |
| dá:ig+as | ---→ | dáaig+as |
| váik+as | ---→ | váik+as |
| rát+as | ---→ | rát+as |

But now a problem arises with the interaction of this treatment of accent with the rules of Vowel Truncation, and Osthoff's Law. For given /káaim+as/, Vowel Truncation, which was formulated to delete the first of three consecutive vowels, would apply to delete the initial vowel giving /kaim+as/ with loss of all accentual information. Similarly, Osthoff's Law was originally formulated to delete the second component of a long vowel in the environment ___ R C; but it could just as easily have been formulated to truncate the initial mora. But such a formulation would have taken /píiln+as/ to /piln+as/, again with loss of accent. However notice that in both cases when the length of the syllable is changed, the underlying opposition between acute and circumflex is still maintained. This retention of the accent is reminiscent of the problem of /brés+ti/ ---→ /bréés+ti/, touched upon, but never solved, in the first chapter.

In order to handle this problem I introduced a convention which I called Accent Copy. This convention applied after each phonological rule affecting the length of a syllable. According to this convention, if the accent fell on the initial mora of a syllable prior to a rule having an effect on the length of a syllable, then this convention copied the accent onto the initial mora of the same syllable after the rule affecting the length. And similarly if the accent fell on the

final mora of a syllable whose length was altered by some phonological rule, then the convention copied the accent onto the final mora. Hence, the opposition between accent on the initial and final mora of a syllable was retained. Thus we would have derivations like the following.

| | /kˈaaim+as/ | /pˈiiln+as/ | /brenˈs+ti/ |
|---|---|---|---|
| Vowel Truncation | kaim+as | -------- | -------- |
| Accent Copy | kˈaim+as | -------- | -------- |
| Osthoff's Law | ------- | piln+as | -------- |
| Accent Copy | ------- | pˈiln+as | -------- |
| Nasal Elision | ------- | -------- | bres+ti |
| Compen. Length. | ------- | -------- | brees+ti |
| Accent Copy | ------- | -------- | breˈes+ti |

In addition this convention will have no effect on syllables undergoing Leskien's Law shortening, since both before and after the shortening the accent remains on the initial mora of the syllable. Finally, if we adopt a suggestion of McCawley's[9], and assume that accent is placed on morae boundaries, rather than directly on the morae themselves, it is possible to explain why forms like rãtas with a short underlying vowel get a circumflex rather than, say, an acute accent when they are lengthened. This would be because the rule of mora assignment would have put the accent on the rightmost mora boundary in the initial syllable of rãtas. Thus, using an asterisk to represent mora boundaries, this form would receive the following representation as a result of mora assignment: /r*a*tˈ+*a*s/. When such a form undergoes Secondary Lengthening, Accent Copy will preserve the accent on the final mora of the syllable, thus guaranteeing a rising accent.

These then were the basic features of my original proposal for handling the problem of the preservation of the accent in Lithuanian. However, recent work by Morris Halle on Slovene accent suggests an alternative solution to our problem.[10] Like Lithuanian, Slovene also has a contrast between rising and falling accents on long syllables.

Halle proposes to treat the falling tone of Slovene as the phonetic reflex of stress on a high-pitched vowel and rising tone as the reflex of stress on a low pitched vowel. Now if we adopt the same interpretation for the rising and falling accents of Lithuanian, another solution to the problem of the preservation of the accent presents itself.

After the Stress Insertion rule and before the rules which neutralize the underlying length contrasts, we will insert the following rule of Tone Assignment into the grammar, which will associate high pitch with a stressed long vowel and low pitch with a stressed short vowel.

(Tone Assignment)

$$\begin{matrix} +\text{ syll.} \\ +\text{ stress} \\ \alpha\text{ long} \end{matrix} \quad \text{---} > \quad \begin{matrix} \alpha\text{ high pitch} \\ -\alpha\text{ low pitch} \end{matrix}$$

Such a rule then gives derivations like the following (where H = high pitch, L = low pitch, and x = stress).

(48)

| | | |
|---|---|---|
| $\overset{x}{p\tilde{i}}$:ln+as | --- | $\overset{x}{p\tilde{i}_H}$:ln+as |
| vilk+as | ---> | $\overset{x}{v\tilde{i}_L}$lk+as |
| $\overset{x}{k\hat{a}}$:im+as | ---> | $\overset{x}{k\hat{a}_H}$:im+as |
| $\overset{x}{v\hat{a}}$ik+as | ---> | $\overset{x}{v\hat{a}_L}$ik+as |
| $\overset{x}{r\hat{a}}$t+as | --- | $\overset{x}{r\hat{a}_L}$t+as |

Now when such forms undergo the various shortening rules, they will still retain the specification for high pitch, and hence, when combined with stress, will come out falling under our new interpretation. Thus, after Vowel Truncation and Osthoff's Law *kâimas* and *pîlnas* will be represented as /$\overset{x}{k\hat{a}_H}$im+as/ and /$\overset{x}{p\tilde{i}_H}$ln+as/, while *vaĩkas* and *vilkas* will be /$\overset{x}{v\hat{a}_L}$ik+as/ /$\overset{x}{v\tilde{i}_L}$lk+as/. Similarly, this treatment allows a straightforward explanation for the preservation of accent in Nasal Elision: /$\overset{x}{br\tilde{e}_L}$ns+ti/ ---> /$\overset{xx}{br\tilde{e}\tilde{e}_{LL}}$s+ti/ or /$\overset{x}{br\tilde{e}_L}$:s+ti.

Superficially it may appear that there is not much to choose between these two possible solutions to the problem. However, I think deeper considerations show the second to be preferred. First, it permits the solution of the problem of accent retention in a fairly straightforward

way without appeal to an essentially new and powerful device like Accent Copy. Hence the second solution limits the number of possible analyses that might be given. The first solution would be preferred here only if it turns out to be the case that such a convention as Accent Copy is needed for other languages, which could not be treated under the second proposal.

Secondly, the second proposal permits a much more natural explanation for why secondarily lengthened vowels in forms like lẽdas and rãtas show up with a circumflex or rising tone rather than a falling tone. Rather than having to appeal to the questionable notion of accent on mora boundaries, the reason that the root vowels in these forms receive a rising tone is that they are underlyingly short vowels and hence are assigned a low tone by the Tone Assignment rule. When these vowels are lengthened by Secondary Lengthening, the rising contour then shows up, since, by hypothesis, under the second proposal rising tone is interpreted as stress on a low toned vowel.

However, despite its appeal, there are certain, perhaps minor, problems of phonetic detail with this proposal. Note that we will have assigned a shortened acute such as the nom. dual form rankì from /rank+$\overset{X}{\underset{H}{i}}$e/ a high tone, while the grave accent of stĩklas originates from a low tone. However, to my ears both of these accented syllables seem to have the same pitch value, which sounds like a simple high pitch accompanied by stress. Presumably this problem can be solved by claiming that the tone distinctions are neutralized not only in unstressed syllables, but also in short syllables. This then would involve saying that the accented syllables in forms like stĩklas, rankì, rankà, etc. are merely stressed with no accompanying pitch assignments. This interpretation of the grave accent, i.e. as merely designating stress, accords with the traditional description, but clearly more precise phonetic investigations would be required in order to corroborate it. Provisionally, then, I will assume a rule of Neutralization, which levels out tone distinctions in unstressed and in short syllables.

(Neutralization)

$$\begin{bmatrix} V \\ [-\text{ stress}] \end{bmatrix} \text{ or } \begin{bmatrix} V \\ [-\text{ long}] \end{bmatrix} \longrightarrow \begin{bmatrix} -\text{ high tone} \\ -\text{ low tone} \end{bmatrix}$$

Finally, if we are to maintain the second proposal we will require a different formulation of de Saussure's Law, which previously was treated in terms of morae. In order to account for the movement of stress from a circumflex or grave to a following acute, we require a rule of the following form.

(de Saussure's Law)

$$\begin{matrix} \text{+ syllabic} \\ \text{+ stress} \\ \text{+ low tone} \end{matrix} \quad C_1 \quad \begin{matrix} \text{+ syllabic} \\ \text{+ high tone} \end{matrix}$$

$$1 \qquad 2 \qquad 3 \quad \text{----->}$$

$$1 \qquad 2 \qquad 3$$

$$[\text{- stress}] \qquad [\text{+ stress}]$$

Although perhaps not as elegant as the "dissimilation" treatment in terms of morae, this formulation still does have a certain intuitive phonetic appeal, since it involves the transfer of stress from a rising syllable to a following falling one. That is, the stress slides over the crest created by the abutting rising and falling tones.

To sum up this section then, we have formulated the following set of ordered accentual rules for Lithuanian.

(49) Stress Insertion: $V \text{ ---> } \acute{V} \; / \; \# \; C_o __ [\text{- stress}]_o \; \#$

Tone Assignment: $\underset{[\alpha \text{ long}]}{\acute{V}} \text{ ---> } \begin{matrix} \alpha \text{ H} \\ -\alpha \text{ L} \end{matrix}$ (H = high tone, L = low tone)

de Saussure's Law: $\underset{[+ L]}{\acute{V}} \; C_1 \; \underset{[+ H]}{V} \text{ ---> } \underset{[+ L]}{V} \; C_1 \; \underset{[+ H]}{\acute{V}}$

Stress Adjustment: $[\text{+ segment}]_1 \text{ ---> } [\text{- stress}] / \; \# \; X \; [\text{+ stress}] __ \; \#$ (where X contains no [+ stress])

Neutralization: $\begin{matrix} V \\ [\text{- stress}] \end{matrix} \text{ ---> } \begin{matrix} \text{- H} \\ \text{- L} \end{matrix}$

$V$
$[\text{- long}]$

Before demonstrating how these rules work in derivations we must consider the treatment of accent in the desinences.

## 3.7. Accentuation in the Desinences

In the previous section we saw that in general it was possible to predict the three different kinds of surface accent in Lithuanian stems

in terms of the underlying length of the syllable. In this section we will see that, although the distribution of tone and stress in the nominal desinences is by no means random, the assignment of these features is essentially independent of length.

As far as their accentual properties are concerned, the nominal endings fall into three major groups. First, there are desinences which are basically stressless and toneless. In the masculine o-stem declension these are the nom., gen., dat., acc., and voc. singular. In the feminine a-stems they are the dat., acc., and voc. singular and the nom. and voc. plural.

Second, there are endings which have an underlying acute or high tone, but are basically stressless, i.e. they do not take the stress in the mobile paradigms, and hence permit the rule of Stress Insertion to apply. (Of course superficially they may end up with the word stress via de Saussure's Law if the preceding stem has a low tone on its final syllable.) In the masc. o-stem declension these endings are the instr. sg. (ratù, cf. gerúoju), nom. dual (ratù, cf. gerúoju), and the acc. pl. (ratùs, cf. gerúosius). For the fem. a-stems the cases are the same: instr. sg. (rankà, cf. gerąsias). Since the case endings of this second group are exactly the same for both declensions, we can consider the high tone on these desinences to be assigned by a rule.

Finally, there are the stressed desinences, i.e. those that take the stress in the mobile paradigms and hence block the rule of Stress Insertion. As far as the tonal properties of these desinences are concerned, let us first observe that the distribution of the tones in this class of desinences is not arbitrary. Most of the endings in this group have an underlying low tone (which shows up as surface circumflex or grave) on the last vowel of the desinence: e.g. in the masc. pl. we have nom. tėvaĩ, gen. tėvų̃, instr. tėvaĩs, loc. tėvuosè; and in the fem. gen. sg. galvõs, loc. sg. galvojè, gen. pl. galvį̃, instr. pl. galvomìs, and loc. pl. galvosè. This leads one to believe that there is a principle of tone assignment which says: "place low tone on the last vowel of the stressed desinences." One's belief in the existence of such a principle

is further strengthened by facts like the following. Many of the desinences are not atomic wholes, but rather seem to be composed of subparts, where the constituent structure is something like theme vowel plus other material, which itself may be complex. When these desinences occur in the long form adjectives, the pronominal element which is characteristic of the latter is sometimes inserted between the theme vowel and part of the remaining material composing the desinence. Thus we find pairs like the following in the instr. pl. feminine short and long form adjectives: geromìs and gerosiõmis. The short form adjective has the structure /root + theme + -mis- s/, where the mi appears to be some sort of infix. Similarly in the long form adjective we have a constituent structure of the following form /root + theme + s/ + /root + theme + -mi- s/. Now what is important in the present instance is that when the element mi is absent from the desinence of the short form constituent of the long form adjective, the long theme vowel (from underlying a:) shows up as circumflex rather than acute as might be expected if the underlying length of a vowel were the determinant of the tone, as it seems to be in the non-derived nominal stems. However, the rising accent on this vowel does agree with the principle of low tone on the last vowel of a stressed desinence.

There are only a few cases which are exceptions to this principle of low tone on the last vowel of a stressed desinence. One systematic exception is the dative case: e.g. feminine dual galvóm and plural galvóms (cf. geróm, gerójom and geróms, gerósioms), and masculine dual and plural langám, langáms (cf. geríem, geríejiem and geríems, geríesiems). Thus in the dative we systematically find an acute accent, which it will be recalled was exceptional in not attracting the accent via de Saussure's Law (rañkom, rañkoms, rãtam, rãtams). Given the regularity of the association of acute accent and the dative case, this suggests that there is another special rule which assigns high tone to the stressed dative desinences. Furthermore, if this rule is ordered after de Saussure's Law we no longer have to mark these desinences as exceptions to the rule.

The other exception to the generalization that stressed desinences take a low pitch is the nom. sg. fem.: e.g. galvà (cf. geróji). Here

the accent must be acute or high tone. I consider this a true exception and hence will enter this desinence in the lexicon as idiosyncratically specified for high tone.

Finally it must be mentioned that the distribution of the feature stress in the desinences is not random, but rather seems to be principled in nature. First, we observe that in the masculine o-stems all of the desinences in the singular are unstressed except for the locative: langè, vaikè, etc. However, as was mentioned earlier this è derives from an underlying particle en, which shows up in the so-called adessive case, which is formed from the locative by the addition of the postposition pi: cf. dienosempi via Nasal Assimilation. Hence this particle may be considered as being outside the case ending system and given a separate lexical representation in which it is stressed.[11] This permits the generalization that all masculine singular desinences are stressless, which of course corresponds to the situation in Slavic. The basic pattern for all declensions in the plural is stressed desinences in the oblique cases and stressless desinences in the nominative and accusative. The masculine o-stem desinence -aĩ is an exception here: langaĩ, vaikaĩ, etc. However, it is worthwhile to note that this ending is not original but seems to have been remade. The original ending was -oi which shows up as ie in present-day Lithuanian in the masculine adjectives: gerì - geríeji. Hence ignoring the masculine nom. pl., we can make the generalization that the oblique plural is associated with stressed desinences, while the nom. and acc. are basically stem stressed. This also corresponds to the situation in Slavic. Finally, in the singular of the feminine a-stems the nom., gen., and loc. are end stressed, while the dat., acc., and instr., have basically stressless desinences. In Slavic the basic pattern seems to have been end stress except for the accusative. In the plural the feminines follow the basic pattern of stem stress in the nominative and accusative and end stress in the oblique.

Hence it would appear that the basic underlying pattern in the distribution of stress in the desinences is one of an opposition between the masculine (stem stressed) and feminine (end stressed) in the singular and a neutralization of this opposition in the plural where the basic

pattern is end stress in the oblique and stem stress in the nominative and accusative. Since I feel that these are true and interesting generalizations, they must be expressed somehow in the description. Towards this end I will say that there is a general rule of stress assignment which stresses the desinences of the feminine singular and the oblique plural. After this rule has applied there will be special rules which destress the dative, accusative, and instrumental feminine singular and stress the desinence of the nominative plural masculine o-stems.

Hence, to summarize this section, we have seen that although the distribution of accent in the desinences is not predictable from underlying length contrasts, it is still not random, but rather exhibits certain regularities, which seem to be governed by the syntactic catagory of case. These regularities are expressed by a series of Stress Assignment rules followed by a series of Tone Assignment rules, which are repeated below.

(50) Stress Assignment Rules

1. stress the desinence of the feminine singular and the oblique plural.
2. destress the desinences in the dative, accusative, and instrumental singular feminine.
3. stress the nominative plural o-stem masculine desinence.

Tone Assignment Rules

1. assign high tone (acute) to the instrumental singular, nominative dual, and accusative plural masculine o-stem and feminine a-stem desinences.
2. assign low tone to the last vowel of the stressed desinences except for the nominative singular feminine.
3. assign high tone to the stressed dative case desinences.

3.8. Sample Derivations and Concluding Remarks on Accent

I shall begin this section with sample derivations from each of the three kinds of cases discussed in the previous section (stressless and toneless, stressless and high toned, and stressed desinences) in

order to illustrate how the rules of accent which I have developed apply. To save space it will be assumed that the rules of Stress and Tone Assignment for the desinences have already applied:

(51) Nominative Masculine Singular

| | /kā:im+as/ | /rāt+as/ | /la:ng+as/ | /vaik+as/ |
|---|---|---|---|---|
| Stress Insertion | -------- | ------ | lā:ng+as | vāik+as |
| Tone Assignment | kā:im+as<br>H | rāt+as<br>L | lā:ng+as<br>H | vāik+as<br>L |
| Vowel Truncation | kāim+as<br>H | ------ | -------- | ------- |
| Osthoff's Law | ------- | ------ | lāng+as<br>H | -------- |
| Secondary Length. | kā:im+as<br>H | rā:t+as<br>L | lā:ng+as<br>H | --------[12] |

(52) Instrumental Singular Feminine

| | /vā:rn+a:#/<br>H | /rānk+a:#/<br>H | /ga:lva:#/<br>H | /kalb+a:#/<br>H |
|---|---|---|---|---|
| Stress Insertion | -------- | ------- | gā:lv+a:#<br>H | kālb+a:#<br>H |
| Tone Assignment | vā:rn+a:#<br>H H | rānk+a:#<br>L H | gā:lv+a:#<br>H H | kālb+a:#<br>L H |
| Osthoff's Law | vārn+a:#<br>H H | -------- | gālv+a:#<br>H H | -------- |
| de Saussure's Law | -------- | rank+ā:#<br>L H | -------- | kalb+ā:#<br>L H |
| Leskien's Law | vārn+a#<br>H H | rank+ā#<br>L H | gālv+a#<br>H H | kalb+ā#<br>L H |
| Secondary Length. | vā:rn+a#<br>H H | ------- | gā:lv+a#<br>H H | ------- |
| Neutralization | vā:rn+a#<br>H | rank+ā# | gā:lv+a#<br>H | kalb+ā# |

(53) Genitive Singular Feminine

| | /vá:rn+á:s/ | /rank+á:s/ | /ga:lv+á:s/ | /kalb+á:s/ |
|---|---|---|---|---|
| | L | L | L | L |
| Stress Insertion | --- | --- | --- | --- |
| Tone Assignment | vá:rn+á:s<br>H L | rank+á:s<br>L L | --- | --- |
| Osthoff's Law | várn+á:s<br>H L | --- | galv+á:s<br>L | --- |
| de Saussure's Law | --- | --- | --- | --- |
| Leskien's Law | --- | --- | --- | --- |
| Tensing | várn+ó:s<br>H L | rank+ó:s<br>L L | galv+ó:s<br>L | kalb+ó:s<br>L |
| Stress Adjust. | várn+o:s<br>H L | rank+o:s<br>L L | --- | --- |
| Secondary Length. | vá:rn+o:s<br>H L | --- | --- | --- |
| Neutralization | vá:rn+o:s<br>H | rank+o:s<br>L | --- | --- |

(54) Nominative Singular Feminine

| | /vá:rn+á:#/ | /rank+á:#/ | /ga:lv+á:#/ | /kalb+á:#/ |
|---|---|---|---|---|
| | H | H | H | H |
| Stress Insertion | --- | --- | --- | --- |
| Tone Assignment | vá:rn+á:#<br>H H | rank+á:#<br>L H | --- | --- |
| Osthoff's Law | várn+á:#<br>H H | --- | galv+á:#<br>H | --- |
| de Saussure's Law | --- | rank+á:#<br>L H | --- | --- |
| Leskien's Law | várn+á#<br>H H | rank+á#<br>L H | galv+á#<br>H | kalb+á#<br>H |
| Stress Adjust. | várn+a#<br>H H | --- | --- | --- |
| Secondary Length. | vá:rn+a#<br>H H | --- | --- | --- |
| Neutralization | vá:rn+a#<br>H | rank+á# | galv+á# | kalb+á# |

To sum up then we see that it is indeed possible to reduce the number of accent classes in the traditional taxonomy to null and to define the accentual behavior of the various classes of nominals in terms of the underlying accentual properties of their constituent stems and desinences. The distinction between the mobiles and immobiles is based on the rules of Stress Insertion and Stress Adjustment and the contrast between underlying stressed and stressless stems and desinences. The distinction between the odd and even numbered classes in the traditional taxonomy is defined in terms of the rule of de Saussure's Law and the underlying contrast between high and low pitch stem final syllables and high and low pitched desinences.

Finally, it must be pointed out that the distinction between the mobile and immobile classes, since it is defined in terms of stress, is essentially independent of the assumption that the tones are predictable in terms of an underlying length contrast. Thus, we can easily dispense with the underlying length contrast in diphthongs (pi:ln- versus vilk-) and distinguish these stems in terms of an underlying tonal contrast as $pi\underset{H}{}ln$- and $vi\underset{L}{}lk$-. Since these latter stems have no underlying stress, we are still able to characterize the difference between the mobile and immobile classes in terms of stressed and stressless stems. Note that such an option is not available in a description which operates in terms of a single underlying feature of "accent" which comes out as stress plus high pitch phonetically. It is this latter drawback which, it seems to me, argues strongly in favor of the second interpretation of the Lithuanian accents in terms of high and low pitch plus stress, over the initial interpretation in terms of high pitched morae. Obviously the validity of this second interpretation depends crucially on the phonetic plausability of considering a falling contour as stress on a high pitched vowel and rising as stress on a low pitched vowel. At the moment I am unable to make a judgment on this matter.

FOOTNOTES

[1]For a discussion of the concept "mora" from the standpoint of generative phonology, see McCawley (1968).

[2]For an interesting discussion of the accentual development of Lithuanian, see Darden (1968).

[3]See, for example, Senn (1966).

[4]This rule is a synchronic reflex of a sound change known as Leskien's Law. See Leskien (1881).

[5]This rule is a synchronic reflex of another sound change known as de Saussure's Law. See de Saussure (1896).

[6]See Coats (1970) and Stang (1965).

[7]See McCawley (1968) and Hill (1968).

[8]Of course one can make a distinction between an accentual unit as a bearer of accent and a measure of accentual distance. Thus it might be said that at this point in the grammar Lithuanian is a "syllable counting mora language," where the measure of distance is the syllable and the accentual bearer is the mora. However, as will be demonstrated momentarily there are other problems encountered in operating with morae here, which indicate that at this point in the grammar at least the mora is not the accentual unit. For a discussion of the distinction between the mora and the syllable as bearers of accent and measures of distance, see McCawley (1968).

[9]See McCawley (1968).

[10]See Halle (1970).

[11]Furthermore, since it is being considered as a morpheme outside of the case system, we can assign this particle a representation with a long stressed vowel /ẽ:n/ which will get a high tone by the Tone Assignment rule. Of course we now need to make use of the minor rule eliding the word final nasal and compensatorily lengthening the preceding vowel. If this rule is ordered before Leskien's Law, then the derived long acute vowel can be shortened by the latter rule.

[12]We must block Secondary Lengthening here. This rule was originally formulated to lengthen accented non-high vowels, where accent was conceived of as high pitch on morae. We now want the conditioning factor to be stress and must furthermore prevent the rule from applying to the low vowel component of rising (low tone) diphthongs such as vaĩkas or añtis, but permit the rule to apply to

the low vowel components of the falling diphthongs: kâimas, lângas, etc. This can be accomplished by reformulating Secondary Lengthening as follows.

$$\begin{bmatrix} +\text{ syllabic} \\ +\text{ stress} \\ -\text{ high} \\ \langle +\text{ H}\rangle \end{bmatrix} \longrightarrow [+\text{ long}] \;/\; \underline{\quad}\; [-\text{ sonorant}]_1 \quad V \quad \langle [+\text{ sonorant}] \rangle$$

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# Lithuanian Verbal Accentuation[1]

by

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0.1 In the past, Lithuanian accentuation has been treated by a number of scholars; however, most investigations of the problem have centered around diachronic developments. The little synchronic work which has been done has dealt mainly with nominal accentuation, while verbal accentuation has either been neglected entirely or has been given the most superficial analysis. Therefore, it is the intended purpose of this paper to provide a synchronic analysis of Lithuanian verbal accentuation, in the course of which it will become evident that any significant synchronic treatment of verbal accentuation must take into account (at least) the following three factors:

(1) unprefixed verbal forms
(2) prefixed verbal forms
(3) significance of categorial membership

1.1 As a preliminary to our analysis, some general discussion of the Lithuanian verbal system will be helpful. Beginning with intonation, we find that Lithuanian distinguishes three types: acute (´), which indicates a stressed syllable with falling tone; circumflex (~), which indicates a stressed syllable with rising tone; grave (`), which simply indicates word stress and no intonational curve. The acute and circumflex intonations occur only on syllables containing a long vowel or diphthong, while the grave occurs only on those containing a short vowel. Surface falling tone (acute) is the phonetic manifestation of stress on a high-pitched syllable, while surface rising tone (circumflex) represents stress on a low-pitched syllable. A stem-syllable marked grave on the surface derives from an underlying stressed syllable with low pitch.[2]

1.2 Turning our attention more specifically to verbs, we find that the Lithuanian verb is analyzable into four constituent parts: the root, the verb suffix (VS), the tense/aspect marker, and the personal endings.[3] The root is what remains after the VS and the tense/aspect

marker, and the personal endings.[3] The root is what remains after the VS and the tense/aspect marker are removed from the infinitive (e.g. mylėti, where myl- is the root, ė is the VS, and -ti the infinitive marker; áugti, where áug- is the root and -ti is the infinitive marker). The VS may occur in a number of shapes. It may appear, for example, as ∅, as in dìrbti 'to work', ė, as in mylėti 'to love', y, as in matýti 'to see', or o, as in žinóti 'to know'.[4] The ∅ form of the VS occurs in non-derived verbs, while the other three may occur in both derived and non-derived verbs. The tense/aspect marker always appears in the infinitive as -ti, e.g. dìrb-ti. In the present tense, the tense/aspect marker may have one of four possible forms: a, i, o or ja. These are found in verbs of the first, second, and third conjugation classes respectively. (See below for a discussion of the conjugation classes). In the preterit, only the two tense/aspect markers ė and o may occur. The same personal endings are used for both the present and preterit forms. The shapes of these endings can be readily seen in the following paradigms:

| | present | | | Preterit | | |
|---|---|---|---|---|---|---|
| | | | áugti 'to increase' | | | |
| | Sg. | Du. | Pl. | Sg. | Du. | Pl. |
| 1. | áugu | áugava | áugame | áugau | áugova | áugome |
| 2. | áugi | áugata | áugate | áugai | áugota | áugote |
| 3. | áuga | áuga | áuga | áugo | áugo | áugo |
| | | | matýti 'to see' | | | |
| 1. | mataũ | mãtova | mãtome | mačiaũ | mãtėva | mãtėme |
| 2. | mataĩ | mãtota | mãtote | mateĩ | mãtėta | mãtėte |
| 3. | mãto | mãto | mãto | mãtė | mãtė | mãtė |

1.3 There are a few points which merit some discussion. It will be noted that there is a recurring vowel which appears between the root and the ending in all forms except the first and second singular. This is the tense/aspect marker. In the third person where the personal

ending is ∅, the final vowel which appears is actually the tense/aspect marker.[5]

The variation in the first and second singular endings which occurs in the above paradigms (e.g. 1 Sg. áugu vs. mataũ; 2 Sg. áugi vs. mataĩ) is simply a surface result of the application of vowel deletion rules to the same underlying ending. Since one of these rules operates on vowels in word-final position, the full first and second person endings may be seen in the reflexive forms where the addition of the reflexive marker -si prevents the rule from operating because the vowel is no longer in final position, i.e. áugu but reflexive áuguosi. The non-reflexive forms of these two verbs are derived as follows:[6]

| | /aug-a-au/ | /mat-aa-au/ |
|---|---|---|
| metathesis | aug-a-ua | mat-aa-ua |
| V. truncation | aug-ua | mat-a-ua |
| final short. | aug-u | mat-a-u |

The derivation of the second singular forms is exactly the same as that of the first singular, proceding from underlying forms with the ending /-ei/.

The preterits always have long tense/aspect markers. Their surface forms can thus be accounted for in the same manner as the present-tense surface forms of matýti. For example, the first singular preterit of áugti is derived as follows: /aug-aa-au/ → /aug-aa-ua/ → /aug-a-ua/ → áugau (by the same rules used in the above derivation).

2.1 As was stated above, the purpose of this paper is to provide an analysis of Lithuanian verbal accentuation. We begin by examining the following forms.[7]

Group I

| prefixed | | unprefixed | |
|---|---|---|---|
| present | preterit | present | preterit |
| (1) áugti 'to increase' (apáugti 'to become overgrown') | | | |
| apáugu | apáugau | áugu | áugau |
| apáugi | apáugai | áugi | áugai |
| apáuga | apáugo | áuga | áugo |

(2) rĩšti 'to tie, bind' (išrĩšti 'to unite')

| | | | |
|---|---|---|---|
| ìšrišu | išrišaũ | rišù | rišaũ |
| ìšrišì | išrišaĩ | rišì | rišaĩ |
| ìšriša | išrĩšo | rĩša | rĩšo |

(3) rė̃kti[8] 'to shout' (aprė̃kti 'to outshout')

| | | | |
|---|---|---|---|
| aprėkiù | àprėkiau | rėkiù | rėkiaũ |
| aprėkì | àprėkei | rėkì | rėkeĩ |
| aprė̃kia | àprėkė | rė̃kia | rė̃kė |

(4) vilkti 'to pull' (suvilkti 'to pull together')

| | | | |
|---|---|---|---|
| sùvelku | suvilkaũ | velkù | vilkaũ |
| sùvelki | suvilkaĩ | velkì | vilkaĩ |
| sùvelka | suvilko | velka | vilko |

(5) veřkti 'to cry' (apveřkti 'to cry about')

| | | | |
|---|---|---|---|
| apverkiù | àpverkiau | verkiù | verkiaũ |
| apverkì | àpverkei | verkì | verkeĩ |
| apveřkia | àpverkė | veřkia | veřkė |

(6) lìpti 'to climb around on' (aplìpti 'to climb around on')

| | | | |
|---|---|---|---|
| àplipu | aplipaũ | lipù | lipaũ |
| àplipi | aplipaĩ | lipì | lipaĩ |
| àplipa | aplìpo | lìpa | lìpo |

(7) lìpti 'get covered' (aplìpti 'get covered')

| | | | |
|---|---|---|---|
| aplimpù | aplipaũ | limpù | lipaũ |
| aplimpì | aplipaĩ | limpì | lipaĩ |
| aplim̃pa | aplìpo | lim̃pa | lìpo |

(8) mė́gti 'to like' (pamė́gti 'to find pleasure in')

| | | | |
|---|---|---|---|
| pamė́gstu | pamė́gau | mė́gstu | mė́gau |
| pamė́gsti | pamė́gai | mė́gsti | mė́gai |
| pamė́gsta | pamė́go | mė́gsta | mė́go |

Group II (A)

(9) mokė́ti 'to pay' (užmokė́ti 'to pay one time')

| | | | |
|---|---|---|---|
| užmõku | užmokė́jau | mõku | mokė́jau |
| užmõki | užmokė́jai | mõki | mokė́jai |
| užmõka | užmokė́jo | mõka | mokė́jo |

(10) drebė́ti 'tremble' (sudrebė́ti 'to tremble violently')

| | | | |
|---|---|---|---|
| sùdrebu | sudrebė́jau | drebù | drebė́jau |
| sùdrebi | sudrebė́jai | drebì | drebė́jai |
| sùdreba | sudrebė́jo | drẽba | drebė́jo |

(11) vazinė́ti 'drive around' (suvazinė́ti 'ride too much')

| | | | |
|---|---|---|---|
| suvazinė́ju | suvazinė́jau | vazinė́ju | vazinė́jau |
| suvazinė́ji | suvazinė́jai | vazinė́ji | vazinė́jai |
| suvazinė́ja | suvazinė́jo | vazinė́ja | vazinė́jo |

(12) vartõti 'use' (suvartõti 'use up')

| | | | |
|---|---|---|---|
| suvartõju | suvartõjau | vartõju | vartõjau |
| suvartõji | suvartõjai | vartõji | vartõjai |
| suvartõja | suvartõjo | vartõja | vartõjo |

(13) galė́ti 'be able' (nugalė́ti 'defeat, conquer')

| | | | |
|---|---|---|---|
| nùgaliu | nugalė́jau | galiù | galė́jau |
| nùgali | nugalė́jai | galì | galė́jai |
| nùgali | nugalė́jo | gãli | galė́jo |

(14) mylė́ti 'love' (sumylė́ti 'to entertain well')

| | | | |
|---|---|---|---|
| sumýliu | sumylė́jau | mýliu | mylė́jau |
| sumýli | sumylė́jai | mýli | mylė́jai |
| sumýli | sumylė́jo | mýli | mylė́jo |

(15) ieškõti 'seek' (apieškõti 'search thoroughly')

| | | | |
|---|---|---|---|
| apíeškau | apieškõjau | íeškau | ieškõjau |
| apíeškai | apieškõjai | íeškai | ieškõjai |
| apíeško | apieškõjo | íeško | ieškõjo |

Group II (B)

(16) lãvinti 'instruct, train' (palãvinti 'teach a little')

| | | | |
|---|---|---|---|
| palãvinu | palãvinau | lãvinu | lãvinau |
| palãvini | palãvinai | lãvini | lãvinai |
| palãvina | palãvino | lãvina | lãvino |

(17) grìsinti 'to bore' (nugrìsinti 'to become bored with')

| | | | |
|---|---|---|---|
| nugrìsinu | nugrìsinau | grìsinu | grìsinau |
| nugrìsini | nugrìsinai | grìsini | grìsinai |
| nugrìsina | nugrìsino | grìsina | grìsino |

(18) kósėti 'cough' (pakósėti 'cough up')

| | | | |
|---|---|---|---|
| pakósiu | pakósėjau | kósiu | kósėjau |
| pakósi | pakósėjai | kósi | kósėjai |
| pakósi | pakósėjo | kósi | kósėjo |

(19) mérdėti 'to be dying' (sumérdėti 'to die')

| | | | |
|---|---|---|---|
| sumérdžiu | sumérdėjau | mérdžiu | mérdėjau |
| sumérdi | sumérdėjai | mérdi | mérdėjai |
| sumérdi | sumérdėjo | mérdi | mérdėjo |

(20) gélbėti 'help' (sugélbėti 'help with diligence')

| | | | |
|---|---|---|---|
| sugélbiu | sugélbėjau | gélbiu | gélbėjau |
| sugélbi | sugélbėjai | gélbi | gélbėjai |
| sugélbi | sugélbėjo | gélbi | gélbėjo |

(21) válgyti 'to eat' (išválgyti 'to eat up')

| | | | |
|---|---|---|---|
| išválgau | išválgiau | válgau | válgiau |
| išválgai | išválgei | válgai | válgei |
| išválgo | išválgė | válgo | válgė |

(22) matýti 'to see' (apmatýti 'to look over')

| | | | |
|---|---|---|---|
| apmataũ | apmačiaũ | mataũ | mačiaũ |
| apmataĩ | apmateĩ | mataĩ | mateĩ |
| apmãto | apmãtė | mãto | mãtė |

(23) stýroti 'to be rigid' (pastýroti 'remain rigid')

| | | | |
|---|---|---|---|
| pastýrau | pastýrojau | stýrau | stýrojau |
| pastýrai | pastýrojai | stýrai | stýrojai |
| pastýro | pastýrojo | stýro | stýrojo |

2.2 In the discussion which follows we will develop our analysis by considering the paradigms given above. The paradigms fall into two major groups: verbs with uncharacterized infinitives (the first group, e.g. áugti) and verbs with characterized infinitives (the second group, e.g. mokéti).[9] The division into these two groups forms the basis for the discussion in the rest of the paper. In the course of what follows, we will show why consideration of categorial information and prefixed verbs is necessary if an adequate description of verbal accentuation is to be achieved.

2.2.1 The first paradigm given is that of áugti, which represents a large group of first conjugation verbs with an acute accent which remains fixed on the root syllable throughout the paradigm. A comparison of this paradigm with that of the next example, rĩšti, reveals crucial accentual differences. In rĩšti, we find that the unprefixed and prefixed forms of the preterit, unlike the corresponding forms of áugti, show an alternation of accent between the root and the ending in the first and second persons singular. In the prefixed forms of the present tense of rĩšti, however, the accent remains fixed on the prefix.

2.2.2.1 These alternations of accent between the root and the ending result from the operation of the synchronic reflex of a historical phenomenon first noticed by Ferdinand de Saussure. The process as de Saussure first described it involved the shift of accent from a syllable with circumflex or grave intonation to an immediately following syllable with acute intonation. In keeping with the interpretation of surface accentuation given above in 1.1, the synchronic reflex of this process may be formulated as:

(DSL) $\begin{matrix} \text{+ syllabic} \\ \text{+ stress} \\ \text{+ low tone} \\ 1 \\ 1 \\ \text{[-stress]} \end{matrix}$ $C_1$ $\begin{matrix} \text{+ syllabic} \\ \text{+ high tone} \\ 3 \\ 3 \\ \text{[+ stress]} \end{matrix}$ →

By this rule an accent on an underlying low-pitched syllable shifts to an immediately following high-pitched syllable. The fact that DSL requires a sequence of low tone followed by high tone explains why certain forms of rȉšti have undergone accent shift, while the corresponding forms of áugti have not. That is, the stem rȉš-, with grave accent (from underlying low tone) satisfies the low-pitched part of the environment for DSL, and whenever this stem is coupled with a high-pitched ending, stress shifts to the ending by DSL. The stem áug- however, as is evidenced by its acute accent, has an underlying high pitch and thus, regardless of the pitch of the ending which is added, forms built on this stem can never satisfy the environment for DSL. Since the 1 and 2 Sg. endings are the only ones which may with any certainty be said to have underlying high pitch (cf. the reflexive forms of these endings -úosi and -íesi, where they occur in their unshortened forms), it is obvious why only these particular endings are eligible to receive stress by DSL. Furthermore, the fact that DSL specifies contiguous syllables in its environment explains why it is that, even though accent may occur on the endings of the 1 and 2 Sgs. in the unprefixed forms of the present, no such alternation ever occurs in the prefixed forms. That is, whenever the stress occurs on the prefix there is always at least one syllable (the root) intervening between the prefix and the high-pitched endings, making it impossible for such forms to ever meet the environment for stress shift by DSL.

2.2.1.2 At this point we should consider the derivational processes by which the first and second singular endings (which have underlying high tone) occur with surface grave (present tense) or circumflex

(preterit). The underlying representation of the 1 Sg. present of the verb rĩšti is /riš-a-au/. The root has a short vowel and will thus have a low pitch in the underlying representation. As stated above, the ending has an underlying high pitch (a stressed vowel is marked with an x): /rĩš-a-au/. Metathesis and vowel truncation yield the
lo hi
form /rĩš-ua/. Final shortening now applies, giving /rĩš-u/[10] which
lo hi lo hi
becomes ( by DSL)/rišũ/. Notice that the final shortening rule has
lo hi
produced a short vowel (u). This u, however, still has the high pitch which the diphthong au had at the beginning of the derivation. Since Lithuanian does not permit a high pitch on a short vowel on the surface (cf. 1.1), there has to be some mechanism to change the pitch from [ +high] to [ +low], thus creating a permissible surface combination of vowel length and pitch. A similar problem exists in the preterit. However, because there is a long theme vowel in the preterit, after vowel truncation and final shortening apply, we are left with a surface diphthong: /rĩš-aa-au/ → /rĩš-aa-ua/ → /rĩš-a-ua/ → /rĩš-a-ũ/.
lo hi lo hi lo hi lo hi
Since an acute is not allowed in final position, the [+ high] of the ending will have to be changed to [+ low]. Low pitch on a long vowel or diphthong is realized as surface circumflex. Thus, the final form of this 1 Sg. is rišaũ.

2.2.1.3 The question now arises as to why the accent should fall on the prefix in the present tense forms of -rĩšti but on the root syllable of -áugti, the only obvious difference between the two roots being that áugti has a high pitch on the root syllable while rĩšti has a low pitch. In order to answer the above question, it is necessary to examine the other paradigms.

2.2.2 Looking at the unprefixed forms of the third example, rė̃kti, we see that the distribution of accent between the root and the ending is the same as the distribution in the unprefixed forms of rĩšti. Such a correspondence is logical since both rĩšti and rė̃kti have low pitch on the root, the only difference being that rĩšti has a grave accent and rė̃kti has a circumflex. In spite of the similarity of

behavior with respect to DSL between rìšti and rẽkti, the accentuation of their prefixed forms, however, is totally different. In the present tense, rẽkti, like áugti, is accented on the root syllable. However, in the preterit, rẽkti has the accent invariably on the prefix, unlike either áugti or rìšti. It is unclear at this point why the accentual difference occurs in the prefixed forms of the present tense. However, the accentual difference in the preterit may be due to the fact that áugti and rìšti have o preterits, while rẽkti has an ė preterit. An examination of all of the paradigms given above reveals that with the exception of third conjugation verbs in -yti, all verbs which have an ė preterit show identical accentuation in the prefixed forms of the preterit (i.e. the accent is always on the prefix). On the other hand, the accent is always on the root in the o preterit.

2.2.3 The next example, viĩkti, represents a class of ablauting verbs having i in the root syllable of the infinitive and preterit and e in the present. The distribution of the accent of this verb is identical to that of rìšti. However, the accent itself is the same as that of rẽkti (i.e. circumflex). This verb and the next example veĩkti are different from the others which have been discussed in that they both have root syllables with mixed diphthongs. (A mixed diphthong is a vowel plus a resonant in a closed syllable (viĩk-), as opposed to a vocalic diphthong (as ir áug-), which consists of a non-high followed by a high vowel). There is nothing else of significance to say about the viĩkti and veĩkti types at this point. They will be more relevant to a later discussion.

2.2.4 lĩpti and mė́gti represent a class of verbs in which the present stem is characterized by the addition of a nasal infix and an -st- suffix respectively. The nasal infix and the -st- suffix are in general used to form inchoative intransitives. Verbs which have an infix or suffix added in the present always have the accent on the root or on the ending (i.e. never on the prefix). For example, the nasal-infixed present lĩmpa has the prefixed form aplĩmpa, but the uncharacterized present lìpa has the prefixed form àplipa. The explanation for this accentual difference will present itself in the course of our analysis.

2.3 Having so far looked at an example of each of the types of verbs which have uncharacterized infinitives, we will now examine these verbs as a whole in an attempt to find an underlying principle of accentuation. From a general survey of the accentuation of verbs with uncharacterized infinitives, it appears that these verbs can be divided into two groups:

(1) Verbs like áugti, rė̀kti and veřkti, which have the accent on the root in the prefixed forms of the present (the accent on the 1 and 2 Sg. endings of rė̀kti and veřkti is of course due to the operation of DSL).

(2) Verbs like rĩšti and viĨkti, which have the accent on the prefix in the present tense.

An examination of verbs which fall into Group I reveals that they are all alike in one respect: they all have an underlying heavy root syllable. (A heavy syllable is one which contains a long vowel or a vocalic diphthong or a mixed diphthong followed by a consonant). On the other hand, the majority of the verbs which fall into Group II have an underlying light root syllable. (A light syllable is an open syllable which contains a short vowel). Group II also includes a few verbs with heavy root syllables (cf. viĨkti). These latter all ablaut, having il, im, ir and in in the infinitive and preterit and el, em, er and en in the present. Thus, their exceptionality is predictable. The accentual difference which exists between aplim̃pa, the characterized present of lĩpti, and àplipa, the uncharacterized present of lĩpti, was pointed out above. It is clear now that this accentual difference is due to the fact that the nasal-infixed present aplim̃pa has a heavy root syllable which doesn't ablaut with lemp-*, whereas the uncharacterized present àplipa has a light root syllable. Similarly, presents which are formed by the addition of the -st- suffix also have heavy root syllables and thus always have the root accented in prefixed forms.

2.4 It appears then from the evidence presented above, that the place of accent is predictable in the present, preterit, and infinitive of both prefixed and unprefixed verbs with uncharacterized infinitives.

2.4.1 It is a fact of the language that verbal roots are monosyllabic.[11] Therefore, since in unprefixed verbs, the accent is always on the root

syllable, there is never any question of where the accent will occur, making it automatically predictable and therefore assignable to the root syllable by an early rule.

2.4.2 In prefixed verbs, the predictability of occurrence of the accent between the root and the prefix makes it possible to assign accent to prefixes as well as to roots: in the present tense, the accent will be assigned to the root syllable just in case that syllable is heavy. If the root syllable is light, the accent will be assigned to the prefix. In the ė preterit, the accent will always be assigned to the prefix, while infinitives and forms of the o preterit will receive root accent.

The ablauting verbs discussed above (viĮkti, etc.) will be exceptions to the rule which assigns accent to a heavy root syllable and will have to be marked as having accent assigned to the prefix.

2.5 The discussion so far has been based solely on observations about the accentuation of verbs with uncharacterized infinitives. Before any conclusions can be drawn about Lithuanian verbal accentuation as a whole, it will be necessary to extend our investigation to include the language's second major group of verbs---those with characterized infinitives.

3.1 In order to facilitate discussion, we will begin by limiting ourselves to examination of the accentuation of the unprefixed forms of verbs with characterized infinitives (paradigms of verbs with characterized infinitives occur under Group II in section 2.1 above). A look at the paradigms in Group II reveals that these verbs exhibit a variety of accentual patterns, so that for example, we find kóšėti with root stress in all categories (recall that those forms which have ending-accent can be analyzed as underlyingly root stressed and as having undergone stress shift by DSL) and vazinėti with stress on the verb suffix in all categories. There exist also verbs such as drebėti, which have accent on the root in certain categories and on the verb suffix in others. What is significant for the present discussion is the fact that the following generalization holds true for the paradigms of all unprefixed verbs with characterized infinitives:

In all categories where the verb suffix is present on the surface, there is never any variation in the place of accent; either (a) the stress will always occur on the verb suffix (vazinėti) or (b) stress will always occur on the root in all forms (kósėti). It should be emphasized that paradigms like that of drebėti, with alternation of stress between root and VS, do not consitute exceptions to the above generalization. Since the VS is not present in certain categories of this verb, it is of course impossible for the accent to occur anywhere but on the root in these categories. In all categories where the VS does occur however, in keeping with our generalization, there is no accentual alternation, stress occurring invariably on the VS. (We will for the moment disregard the accentuation of those categories in which no VS occurs and return to them later in our discussion). We will henceforth refer to verbs which have stress on the VS whenever it is present as Type (A) verbs and those which have root stress as Type (B) verbs.

3.2 The question now arises as to whether there is any way to predict which verbs will fall under Type (A) and which will be accented in accordance with Type (B). Clearly there is no purely segmental means of distinguishing between the two types. However, a general examination of verbs with characterized infinitives reveals that those of Type (B) are distinguishable on the basis of certain shared semantic and morphological characteristics. Thus, it seems that the vast majority of verbs which are semantically characterizable as iteratives, intensives or duratives predictably exhibit root accent (e.g. kósėti 'to cough', mérdėti 'to be dying', stýroti 'to be rigid'). In addition, it is possible to predict that any verb which belongs to the third conjugation(i.e.whose infinitive ends in -oti or -yti)will fall into accent type (B). Similarly, all verbs with infinitives in -inti will have Type (B) accentuation. (It will be noted that there is a certain amount of overlap between these semantic and morphological categories, so that for example there exist some iteratives, intensives or duratives which are at the same time characterizable as third

conjugation -yti or -oti verbs. It would not however even be necessary to characterize such verbs semantically, since they automatically fall into the more general group according to their morphological configuration).

3.3 It seems then that accentuation of the unprefixed forms of verbs with characterized infinitives is by and large predictable: In all forms where there is no VS present, accent will of course be on the root. In forms where the VS occurs, the accent will be on the VS--- unless the verb in question belongs to the class of iteratives, duratives or intensives or is classifiable as a third conjugation verb or a verb in -inti, in which case the accent will occur on the root syllable.

3.4 Expanding our examination to include prefixed forms reveals that, in all categories where the VS is present, division into Type (A) and Type (B) verbs still holds. Thus, for any given category, as long as the VS occurs, accent will never be on the prefix; it will invariably be on the root for all verbs which are distinguishable as Type (B) verbs on the basis of their semantic and morphological characteristics; and it will invariably be on the VS for all other verbs (i.e. for all Type (A) verbs).

3.5 Returning now to discussion of the paradigms of verbs with characterized infinitives which do not have the VS present in all categories, we find that wherever there is no VS present accentuation may follow one of two patterns: First of all, if it is the case that the verb in question is classifiable as Type (B), then stress will invariably occur on the root, with the prefix never receiving the accent. If on the other hand the verb in question does not qualify as Type (B), then the accentuation will follow exactly the pattern which was described in 2.3 above for verbs with uncharacterized infinitives.[12]

3.6 The above observations seem to indicate then that in all instances, verbs of Type (B) have accent fixed predictably on the root. It would not seem unreasonable then to capture this fact by assuming that the grammar of the Lithuanian speaker contains some very early rule which says something like the following: Accent the root of all iteratives, intensives and duratives, third conjugation verbs, and

verbs in -inti.

All other verb forms with the VS present on the surface (i.e. all Type (A) verbs) predictably have stress on the VS. The speaker's probable intuitions about this could similarly be characterized by a rule which states simply: Accent the VS whenever it is present. Note that this rule would logically be ordered after the one which accents Type (B) roots. Such an ordering may readily be seen to allow both the simplest statement of the two rules and the simplest analysis in general, since the opposite ordering would necessitate either (1) a more complicated statement of the VS accent rule which would actually repeat the environment for the Type (B) accent rule or (2) the addition of some sort of de-stressing rule to remove stress from the VS in all Type (B) verbs. That is, if the VS assignment rule were to be ordered first, it would have to be stated in such a way as to accent the VS wherever it is present, except in precisely those semantic and morphological categories where the Type (B) accent rule will apply to accent the root. Alternatively, the VS accent rule could be stated as originally given above and would thus stress the VS everywhere. When the Type (B) rule then applied, each Type (B) form would receive a root stress---regardless of whether or not the form had already received a VS stress by the previous rule. This would yield forms with two stresses, necessitating some kind of de-stressing rule to remove the right-most stress (i.e. the one on the VS).

3.7 Finally, it should be noted that ordering the above two rules before whatever processes are responsible for the accentuation of verbs with uncharacterized infinitives would account for why, in those categories where the VS is not present, Type (B) forms invariably have the root accented, but Type (A) verbs behave exactly like verbs with uncharacterized infinitives. That is, all forms of Type (B) verbs (whether the VS is present or not) receive stress by a very early rule. Then, all Type (A) verb forms which have the VS present receive stress by another early rule. This leaves still unaccented those Type (A) verbs without a VS, so that they naturally participate in the same accent assignment processes which act on the forms of verbs with

uncharacterized infinitives.

4.1 Having now examined all of the relevant types of verbs in the language, it will be helpful to summarize briefly the observations which have been made concerning these:

4.1.1 The largest group of verbs in the language are those with uncharacterized infinitives. Unprefixed forms of these verbs have root accent except when the accent has been shifted to certain endings by the rule DSL (cf. section 2.2.1.1). Prefixed forms are accented as follows: The infinitive and o-preterit always have the accent on the root syllable; the e-preterit always has the accent on the prefix; the present has the accent on the root syllable if this syllable is heavy and on the prefix if this syllable is light.

4.1.2 Verbs with characterized infinitives display several accentual patterns.

4.1.2.1 Certain verbs, both prefixed and unprefixed, have root accent in all tenses. These verbs fall into clearly defined classes, making it possible to characterize their accentuation categorially.

4.1.2.2 The remaining verbs, both prefixed and unprefixed, with characterized infinitives have the VS accented wherever it is present.

4.1.2.3 In present-tense forms where there is no VS, and where the root has not received stress by one of the categorial root assignment rules, prefixed forms will be accented in accordance with the weight of their root syllables, just as are prefixed forms of uncharacterized verbs. Unprefixed forms will, of course, be accented on the root syllable.

4.2 It appears that the principles of accentuation suggested for uncharacterized verbs can be extended, then, to the entire class of primary verbs by the addition of two rules: one rule to assign accent to the roots of verbs in the categories which have surface root accents in all tenses (iteratives, intensives, etc.); another to assign accent to the verb suffixes of the rest of the characterized verbs (cf. mokéti).

5.1 Working within the above framework, then, we can say that verbs fall into two major groups: the first consists of those which have the accent assigned by category to the root syllable in all tenses,

while the second is made up of verbs whose accentuation varies according to whether or not a VS is present and according to tense (i.e. verbs whose accent is assigned largely by tense rather than by a more general category).

The accent assignment rules, in the order in which they must apply, are as follows:

For prefixed and unprefixed verbs:

(1) Accent the root syllable of iteratives, intensives, duratives, third conjugation verbs with infinitives in -yti and -oti, and verbs with infinitives in -inti.

(2) (Where there has not yet been an accent assigned):

(a) Accent the verb suffix in all tenses where it is present.

For all remaining unprefixed verbs:

(b) Accent the root syllable.

For all remaining prefixed verbs:

(c) Accent the root syllable of infinitives and o-preterits.

(d) Accent the root syllable in the present tense if that syllable is heavy.

(e) Accent the prefix in the present tense if the root syllable is light.

(f) Accent the prefix in the ė-preterit.[13, 14, 15]

5.2 It will be observed that only the first two of the accent assignment rules given above are applicable to both prefixed and unprefixed verbal forms. The reason for this is that for unprefixed verbs it is only in characterized forms that a choice of accent placement exists (i.e. between the root and the VS). For uncharacterized verbs, it is only in prefixed forms that there can be any question of where the accent will be assigned.

5.3 It is logical that the categorial accent assignment rules, which assign the accent to the root in all tenses, would take precedence over all of the other rules. Thus, even though there seems to be a general principle of verb-suffix accentuation, the rule which assigns the accent to these verb suffixes must follow the accent assignment rules of the first group, since a word is allowed to have only one stress.

In turn, the rule which accents the root-syllable of the infinitives and o-preterits must follow the VS accent assignment rule because any infinitive and o-preterit with a VS must have the accent assigned to this VS. We might say, then, that there is a hierarchy of accent assignment. That is, some verbs must already have their accents, as a result of the working of a more general rule, at the time when other accent assignment rules apply. A few examples should serve to clarify the operation of the accent assignment rules: a verb such as pakósėti since it is an iterative, is accented by the first accent assignment rule and receives root accent in all of its tenses, while a verb such as užmokėti, since it was not affected by the first accent assignment rule, has the VS accented in all tenses where it is present (i.e. in the infinitive and in the preterit). No accent has yet been assigned to the present and therefore the rules which assign accents here can apply, placing an accent on the root-syllable, since it is heavy. A verb such as išrišti has root accent in the infinitive (by the rule which accents the roots of infinitives without a VS), prefix accent in the present (išrìša) (because the root-syllable is light), and root accent in the preterit (išrìšo) (by the rule which accents the root-syllable of o-preterits).

6.1 In conclusion, it is appropriate to add that, even though the rules of accent assignment which we have proposed for Lithuanian are able to account for the accentuation of the large majority of verbal forms in the language, there still exist forms which must be considered to be exceptional. A significant number (in fact, nearly all) of these forms are identifiable as exceptions to Accent Assignment Rule (1) (cf. section 5.1).[16] It will be recalled that Rule (1) differs from all the other accent assignment rules in that it is the only one which mentions semantic information in its environment (in addition to the exclusively grammatical or [illegible]cal information required by the other accent rules). Because of the ambiguity and overlap which frequently exist between semantic categories, it is in our opinion quite natural that it would be precisely with respect to the one rule whose application depends on such information that most exceptions would arise. That is,

it would not be surprising at all that there would exist not only a great deal of variation from speaker to speaker about what semantic category a particular verb belongs to, but also that the judgements of a particular speaker would fluctuate, depending on the specific context and usage of the verb in question.

Footnotes

[1]We wish to thank Hans Hock for helpful discussion and suggestions made during the writing of an earlier draft of this paper.

[2]For complete discussion of the derivational processes involved see Kenstowic 's contribution to this volume. It should be noted that occasionally, in the process of derivation,a long final syllable with high pitch is shortened and is thus no longer able to appear with a surface acute (the acute being restricted to long syllables). In this case, the syllable appears on the surface with a grave accent.

[3]This analysis is basically that presented in Kenstowicz's contribution to this volume, which may be consulted for further discussion of the topic.

[4]The underlying forms of these particular verb suffixes are /e:/, /i:/, and /a:/ respectively. The verb suffixes are given in their surface forms throughout the text.

[5]It is notable that each Lithuanian verb uses only one third person form in each tense, making no distinction between singular, dual, and plural.

[6]This derivation is the one given in Kenstowicz's contribution to this volume, which should be consulted for further details. The difference in the underlying forms arises because áugti is a first conjugation verb and therefore has the tense/aspect marker /-a-/, while matýti, being a member of the third conjugation class, has the tense/aspect marker /-aa-/ (surface -o-). For a different view, cf. Hock's second contribution to this volume.

[7]Only the first and second person singular and third person will be cited, as these provide all of the information relevant to the present discussion.

[8]The i which occurs between the root-final consonant and the ending in certain forms of this paradigm is there as a result of the fact that rẽkti is a ia-stem.

[9]The term 'characterized' refers to the fact that a non-Ø VS is present in the form.

[10] Final shortening is the synchronic reflex of Leskien's Law, which shortened word-final high-pitched syllables.

[11] Denominative verbs constitute an exception to this statement, for, being derived from nouns, they often have polysyllabic roots. Their accentuation creates no problems, however, since it seems to be predictable in terms of the nouns from which they are derived.

[12] It might appear at first glance that matýti belongs to Type (A) rather than to Type (B), since the VS is accented whenever present (i.e. in the infinitive) and since, in forms without the VS, the root syllable is heavy and accented in prefixed forms (cf. 3 Sg. pres. apmãto). However, it can be shown that this verb does in fact belong to Type(B)---that is, that the accent has been placed on the root-syllable of this verb just as in other -ýti verbs (e.g. válgyti): There is in Lithuanian a low-level phonetic rule of vowel lengthening, referred to as Secondary Lengthening by Kenstowicz (see his contribution to this volume). According to this rule, stressed non-high vowels are lengthened if they occur in open syllables (and categorially in closed syllables also). (cf. mãto [mã́:to:], but mãtau [matáu], where stress has been moved off the root vowel a by the rule DSL, and the vowel has therefore not been lengthened by the Secondary Lengthening Rule). Since a thorough discussion of this rule can be found in Kenstowicz's contribution to this volume, no more will be said about it here. The important point is that the root vowel a is underlyingly short and, if the VS -ý- had received its accent by the VS accent assignment rule, the prefixed present-tense forms would have prefix accent, since the syllable is still light at the point at which the accent is assigned. Thus, we must assume that all third conjugation verbs in -ýti receive root accent, that non-high short vowels are lengthened later by the low-level lengthening rule, and that an accented -ý- is a result of the application of the rule DSL, since it is accented only in forms which have low pitched root vowels (cf. mãto vs. válgo).

[13] Only the first three rules are ordered with respect to one another. Furthermore, these three rules must be ordered before the remaining four, which may apply in any order.

[14]The accentuation of prefixes is actually not as straightforward as we have presented it in this paper, for when more than one morpheme occurs to the left of the root, it is the rightmost which receives the accent: e.g. 3Sg. pret. ùžlenkė < užleñkti 'bend sideways', but užsìlenkė, where už- is the verbal prefix and si is the reflexive morpheme. Furthermore, when disyllabic prefixes occur, the accent appears on the second syllable of the prefix: e.g. 3 Sg. pret. apìbarė < apibárti 'scold'. Thus, it appears that, for verbal forms, at least, there is a constraint to the effect that the accent may occur no farther than one syllable to the left of the root syllable.

[15]There exists one prefix in the language, namely pér- which is different from all other prefixes in that it is always accented. Because of this clearly exceptional behavior, examination of forms with pér- can be of no great value in determining an analysis of Lithuanian verbal accentuation in general. Therefore, we will merely note the existence of pér- without devoting further attention to it.

[16]For example, gélbėti, given in section 2.1, group II (B) ) is exceptional in that it does not seem to fit into any of the semantic categories which require root accent assignment. Its expected accentuation would be on the VS.

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# The Accentuation of Lithuanian Derived Nominals

Karen Dudas

0.1. Although numerous studies of the accentuation of Lithuanian nominals have been undertaken at one time or another, it seems that most of these (and, as far as I know, all of those done from a generative point of view[1]) have dealt only with primary, non-derived forms, passing over the vast body of nouns which are obvious derivations from verbs, adjectives or other nouns. It is the purpose of this paper to begin the task of providing an adequate description of the accentuation of these derived nominals. In what follows, I will first briefly discuss the suffixation process by which such forms are produced and then describe in detail the apparent relationships between the various types of derivational suffixes and the accentual properties of the derived forms which they produce. Finally, in an attempt to account for these relationships, I will tentatively suggest some linguistic processes which might be relevant to the derivation of nominals. It is hoped thatinthe course of the present paper some progress will be made toward capturing generalizations about the accentuation of derived nominals which may later be found to be valid and significant for the description of the Lithuanian derivational process as a whole.

0.2. At the outset it should be noted that a paper such as this, which deals with the accentuation of derived forms, is of necessity extremely tentative. In the first place, very little is known about the character of the derivational process itself. Furthermore, it has yet to be determined which part of the grammar handles derivation (if indeed there is a separate part which has this function) and what the relationship is between this part and the rest of the grammar. Because nothing can be accomplished without some minimal theoretical framework, in what follows I will be assuming that derivation is carried out by a set of rules and constraints which are very much like those which have been posited by linguists for the phonological component of a generative grammar. It is reasonable that if such rules and constraints meet the various conditions of naturalness which are insisted upon by responsible linguists, they might eventually prove to be of at least some value for the correct

description of the derivational process--even if they should turn out to be wrong in their specifics.

0.2.1. In addition, I will be assuming that the process of derivation is in some way distinct from the rest of the grammar, producing derived stems which may then serve as the underlying representations to which the phonological rules apply. This is a reasonable assumption to make since derived nominals behave exactly like primary forms in declension and therefore probably are acted upon by the same rules; however, the accentual character of the basic parts of a derived nominal (i.e. primary stem plus derivational suffix) is in many cases such that the parts would produce the wrong results if they were to be fed directly into the phonological rules without first going through some distinct process of derivation. For example, the Class 1 primary noun élnis 'stag' plus the derivational suffix -enà in fact produces the Class 3 noun elnenà 'skin of a stag'; however, simply feeding /ĕln+ena/[2] into the phonological rules as an underlying representation would of course produce a declensional pattern of accentuation in accordance with Accent Class 1. Therefore it seems clear that such forms must be acted upon in some way before they reach the phonological rules; and for the present paper I will assume that the relevant processes take place in a distinct part of the grammar.

0.3. Before proceeding, it should also be explained that in what follows the main emphasis will be on the derivation of nouns from other nouns. There are two reasons for this. First of all, the derivational process under discussion is most transparent when it involves derivation from nouns or adjectives, since some purely segmental problems (which have no bearing on the present discussion but could distract one from the issue at hand) which might exist in the derivation of nouns from verbal forms are totally lacking in the former two categories. Secondly, my investigation of derived nominals is as yet incomplete, and what work remains to be done involves the nominalization of verbal and adjectival forms. At this point it seems obvious however that something very similar (if not identical) is going on in derivation from all three categories, and the investigation so far has revealed that whatever may be said about

the derivation of nouns from other nouns is in almost every instance also applicable to nominalizations from verbs and adjectives. Therefore it seems that concentrating on this one area will simplify the discussion considerably without causing any loss of generality.

1.1. In Lithuanian the derivation of nouns is accomplished by affixation of a derivational suffix to either a noun, adjective, or verb stem. For nouns and adjectives, the stem is that part which is left if the nominative singular ending is removed (e.g. nom. sing. élnis forms the stem ẽln-). For verbs there exist three separate stems: the infinitive stem, which is what remains when the infinitive marker -ti is removed; the present stem, which is the third person present tense form minus its tense/aspect marker; and the preterit stem, which is what is left when the ending -ė or -o is removed from the third person form of the preterit. Therefore for the verb mégti 'to like' (3 pres. mẽgsta; 3 pret. mégo) the infinitive, present and preterit stems are mẽg-, mẽgst- and mẽg- respectively. To the best of my knowledge only the infinitive and preterit stems of verbs are ever combined with nominalizing suffixes.

1.2. For each of the three grammatical categories to which nominalizing suffixes may be added there exists a unique set of these suffixes such that the same suffix never appears affixed to stems of more than one category. That is, any given suffix may be combined either with noun stems or with adjective stems, but never with, for example, noun stems and verb or adjective stems. Furthermore, it seems that within the set of suffixes combinable with verb stems additional restrictions exist so that a given suffix may appear affixed either to infinitive stems or to preterit stems, but never to both. It should also be noted that the underlying accentuation of the primary stem[3] plays no part in determining which suffix may be used with it in derivation. That is, a derivational suffix which may appear for example with nouns is combinable with any noun, regardless of the accentuation of that noun.

1.3. It might be pointed out that in Lithuanian any given nominalizing suffix may have one of three functions: it may merely add semantic

content without affecting the grammatical category of the stem (e.g. viĮkas 'wolf' but vilkenà 'wolfskin'); it may change the grammatical category of the stem with which it is combined without altering semantic content (e.g. abejĮngas 'ambiguous' but abejingùmas 'ambiguity'); it may both change the grammatical category of the stem and add semantic content (e.g. séti 'to sow' but sėtùvas 'a machine for sowing'). Naturally all the nominalizing suffixes which are used exclusively with noun stems (this group includes the set of derivational suffixes which may be characterized as diminuitivizers) necessarily have only the first function, while those used with verbs or adjectives may be of either the first or second type.

1.4. There seems to be no restriction on how many times a word may go through the derivation process, or stated differently, a word can conceivably consist of a root plus any number of derivational suffixes.[4] Each time through the process of derivation a new primary stem is created and a new derivational suffix is added. For example, beginning with the stem /paũkšt-/ 'bird', the suffix /-ininkas/ is added to produce paũkštininkas 'one who raises birds'. This word in turn forms the primary stem /paũkštinink-/ to which another suffix /-ystė/ is added to form paukštininkỹstė 'the raising of birds'. Similarly, we find malũnas 'mill'; malũninkas[5] 'miller'; maluninkíenė 'miller's wife'. Compounded diminuitive suffixes naturally result in the intensification of the degree of smallness or endearment. Cf. paũkštis 'bird'; paukštẽlis 'birdie'; paukštelỹtis 'little birdie'.[6]

1.5. Logically, certain semantic restrictions do exist on which primary stems may be combined with what suffix (in addition to the grammatical restrictions already mentioned). Thus, an abstract noun like dárbas 'work' would never appear combined for example with the suffix -ena, which indicates 'the skin of an animal'; so that no form *darbenà would occur in non-poetic speech. However the semantic character of other suffixes is such that they could conceivably be combined with any stem which is otherwise (grammatically) permissible. One of these is -ininkas, which denotes 'one who is involved in some way with X' where X is any noun to which the suffix is added.[7]

2.1. As was noted above, for any nominalizing suffix, there apparently exist no restrictions concerning the accentuation of primary stems with which it may be combined in derivation. That is, any suffix may be affixed to stems belonging to any accent class as long as this would not violate the non-accentual restrictions mentioned above. What is most significant to the present discussion is the fact that for each suffix, regardless of the accentuation of the primary stem with which it is combined, derived forms with certain predictable accentual properties are produced every time that suffix is used. Specifically, for any derivational suffix, it is possible to predict (1) whether the nouns it is used to derive will be accentually mobile or immobile and (2) if the derived noun is immobile, whether the accent will fall on the primary stem or on the suffix.[8] On the basis of these predictable accentual properties which are shared by all derived nominals, it is possible to divide Lithuanian nominalizing suffixes into the following three groups:

2.1.1. Group A, which is by far the largest of the three, includes nearly all the nominalizing suffixes in the language. These Group A suffixes, when they are combined with stems of any accent class, always produce derived nominals which have immobile stress on the derivational suffix (e.g. paũkštis (2)[9] 'bird' but paukštíena (1) 'meat of fowl'; paukštìdė (2) 'birdhouse'; kùnigas (3) 'priest' but kunigijà (2) priesthood'. Of course the pitch of the stressed syllable (for monosyllabic suffixes) determines whether the surface intonation will be acute or grave or circumflex and thus whether the derived noun will be of Accent Class 1 or 2. The following is a list of some of the most common nominalizing suffixes used to derive nouns from other nouns.[10] (For other nominalizing suffixes, see Senn 1966:316-332.)

2.1.1. GROUP A:

| | |
|---|---|
| -ìdė (2) | paũkštis (2) 'bird': paukštìdė (2) 'birdhouse' |
| | arklỹs (3) 'horse'; arklìdė (2) 'horsestail' |
| -íena (1) | élnis (1) 'stag'; elníena (1) 'venison' |
| | vilkas (4) 'wolf'; vilkíena (1) 'wolf meat' |

-ienà (gen. -iẽnos) (2) bùlvė (1) 'potato'; bulvienà (2) 'potato field'
avižà (3) 'barley'; avižienà (2) 'barley field'

-ìenė (1) stum̃bras (2) 'buffalo'; stumbrìenė (1) 'buffalo cow'
sūnùs (3) 'son'; sūnìenė (1) 'daughter-in-law'

-iẽtis (2) káimas (1) 'village'; kaimiẽtis (2) 'villager'
giminė (3) 'relationship'; giminiẽtis (2) 'a relative'

-ijà (gen. -ìjos) (2) brólis (1) 'brother'; brolijà (2) 'brotherhood'
kùnigas (3) 'priest'; kunigìja (2) 'priesthood'

-ýnas (1) dìlgė (1) 'nettle'; dilgýnas (1) 'nettle thicket'
ąžuolas (3) 'oak tree'; azuolýnas 'oak forest'

-ỹnė (2) paũkštis (2) 'bird'; paukštỹnė (2) 'place where birds flock'
akmuõ (3) 'stone'; akmenỹnė (2) 'stoney place'

-ỹstė (2) ateĩvis (2) 'immigrant'; ateivỹstė (2) 'immigration'
kùnigas (3) 'priest'; kunigỹstė (2) 'priesthood'

-ìškis (2) dvasià (2) 'holy spirit'; dvasìškis (2) 'priest'
daubà (4) 'ravine'; daubìškis (2) 'one who lives in a ravine'

-úomenė (1) jaũnis (2) 'young man, youth'; jaunúomenė (1) 'young manhood'
kařias (4) 'an army'; kariúomenė (1) 'the army'

Diminuitivė Suffixes: -áitis (1), -ẽlis (2), -ìkė (2), -ýtis (1), -iùkas (2), -iũkštis (1), -ùkas (2), -ùlis (2), -ùtis (2), -ùžis (2)

2.1.2. Group B consists of those suffixes which always produce mobile nouns of Accent Class 3.[11] There are relatively few suffixes of this type in the language and of the few mentioned by Senn those used with primary noun stems are listed below:

2.1.2.1. GROUP B:

-enà (3) kiáunė (1) 'marten'; kiaunenà (3) 'martenpelt'
veršis (2) 'calf'; veršenà (3) 'calfskin'
vil̃kas (4) 'wolf'; vilkenà (3) 'wolfskin'

-inas (3) stìrna (1) 'roe(deer)'; stìrninas (3) 'roebuck'
mẽškė (2) 'bear'; mẽškinas (3) 'male bear'
avìs (4) 'sheep'; ãvinas (3) 'ram'

2.1.3. Like Group A suffixes, those in Group C always produce derived nominals which have immobile accent. But unlike those in Group A, (which always produce suffix-accented derived forms) those in Group C produce nominals which are accented either on the primary stem or on the derivational suffix, depending on the accentuation of the primary stem: if the stem with which the suffix is combined belongs to Accent Class 1 or 2 (that is, has underlying stress) then in the derived form the accent will remain exactly where it was in the primary stem; if the primary stem is mobile Class 3 or 4, then the derived noun will be accented on the derivational suffix (e.g. áuksas (1) 'gold'; áuksininkas (1) 'goldsmith' but dárbas (3) 'work'; darbiniñkas (2) 'workman'). It seems that thereare very few derivational suffixes of this type in Lithuanian. I know of only one (the nominalizing suffix -ininkas) which definitely belongs to Group C; however, it appears that the suffix -imas/-ymas,[12] which is used to form gerunds, behaves in basically the same way as -ininkas. But because I have not yet fully investigated the formation of Lithuanian gerunds, I am reluctant to offer any definite classification for this suffix. Brief investigation reveals that there are probably also a few suffixes of this sort which occur in other types of derivation (e.g. adjectives derived from nouns), and it is for this reason that I set up a separate Group C at all; hopefully the present discussion will be able to capture some generalization about Lithuanian derivation as a whole. For the time being however, "Group" C consists of -ininkas and this should be kept in mind throughout all of what follows.

3.1. From the above description of Lithuanian derivation it is clear that the first thing to do in attempting to provide an explanation for the accentual relationship between primary forms and the nominals derived from them is to determine the accentual character of the derivational suffixes (since the accentual character of the primary stems is already known) so that a basis will be provided for discussion of the accentual interaction which must occur between stem and suffix in derivation.

3.2. It has already been determined that on the basis of the three accentually different types of derived nominals produced there must be three different types (with respect to accentuation) of derivational suffix. In what follows I will try to account for this triple distinction by establishing a distinct accentual character for each group of suffixes. Of the three suffix types, those of Group A are always accented, those of Group B are never accented and those of Group C are sometimes accented. Disregarding Group C for the moment, it appears that the opposition between Group A and B suffixes resembles in some ways that which exists between immobile and mobile primary nouns. That is, since Group A suffixes are always accented, perhaps it is the case that the accent is simply there in the underlying representation, just as it is for immobile primary nouns. Group B suffixes however never carry word accent and in fact derive forms which end up with no accent in their underlying representations. What this suggests is that perhaps the accentual opposition between Group A and B suffixes is actually one between underlying accent and no underlying accent.

3.3. However, it immediately becomes apparent that such a course misses entirely the major generalization which is to be made about the accentuation of Lithuanian derivational suffixes. Since at least 80% of the nominalizing suffixes which I know of belong to Group A, it seems that the native speaker would feel that the thing to do is stress the suffix in a derived nominal. In other words, the presence or absence of stress is not something which the speaker has to memorize separately for each suffix; on the contrary, he probably feels that any suffix which does not receive stress is in some way exceptional (and it will become clear later that assigning accent by rule also allows a characterization of the speaker's probable feelings on this matter of exceptionality.) Therefore, I will assume that stress is not present in the underlying representations of the derivational suffixes but is assigned by some rule.

3.3.1. In order to determine what the exact character of this rule is, it is necessary to consider suffixes of Groups B and C. First of all, there must be something which prevents the rule from stressing all those

suffixes which have been included in Group B above. Either the stress insertion rule itself is restricted, or the Group B suffixes must be marked as exceptional. Clearly the latter alternative is preferable in this case because of the fact that there are relatively few suffixes included in Group B, and these, since they are never accented themselves and produce Class 3 derived nouns, must be felt by the speaker to behave in a manner which is somewhat unusual--given the great number of Group A suffixes. Furthermore, in addition to being few in number, the Group B suffixes occur in actual usage very infrequently. (This is not surprising, considering the rather specialized meanings of some of them. e.g. -ena 'skin of an animal' and -inas, which is used to indicate the male of the species when the general name of an animal is feminine in gender. e.g. lãpė 'fox' but lãpinas 'male fox'.) Therefore, it will not be assumed that the accent insertion rule for derivational suffixes is restricted with respect to Group B suffixes, but rather that such suffixes are marked as exceptions to the rule. In this way we will hopefully be characterizing what the speaker must feel about the accentuation of Group B suffixes.

3.4. Group C suffixes (i.e. at this point -ininkas), it will be recalled, are sometimes accented and sometimes not, depending on the underlying accentuation of the stem with which they are combined. In keeping with the idea that accentuation of the derivational suffix is a major tendency of the language and thus should not be memorized for each suffix, it would seem desirable to assign stress to these suffixes as well as to those of Group A. (This stress would then have to be removed later in some cases.) However, as a result of saying that the same rule which assigns stress to Group A suffixes operates on those of Group C certain difficulties arise. It will be noted that -ininkas, which appears as -iniñkas when accented, is disyllabic. This means that any rule which is responsible for assigning accent to it must specify that the second (or last) syllable is to receive the stress. However, I know of one other suffix which belongs to Group A and which is also disyllabic. This suffix, -ũomenė, always bears stress on its first syllable. To take care

of this suffix it seems that the suffix stress insertion rule should place stress on the first syllable of the derivational suffix. Obviously the same rule should not accomplish the insertion of stress on both the first and last syllables of derivational suffixes.

3.5. It seems that , if the suffix stress insertion rule is to cover all Group A suffixes, including -ùomenė, then two alternatives are possible: Either (1) the suffix stress insertion rule must be written to specify that accent is inserted on the first syllable (which is of course the only syllable for monosyllabic suffixes) of the suffix and then a minor rule of stress insertion will specify the second syllable to take care of those suffixes like -ininkas; or (2) we can write the suffix stress insertion rule in the same way but assume that stress is underlying for polysyllabic suffixes (like -ininkas) which have the second (or perhaps some other syllable) accented. Neither alternative seems to be preferable to the other. As far as the first is concerned, it does seem true that -ininkas, being a derivational suffix, probably should receive stress at the same time as the Group A suffixes; however, having to use a minor rule to do this seems to neutralize the advantage. On the other hand, the second alternative of assuming that -ininkas is different from all other nominalizing suffixes in the language in that it alone has underlying stress does not really seem to have any advantages or disadvantages that I can see.

3.5.1. It should be noted that this particular problem of what to do about assigning stress to polysyllabic nominalizing suffixes probably arises because of the scarcity of such suffixes in the language. That is, since almost all derivational suffixes are monosyllabic, the suffix stress insertion rule is probably felt by the speaker to need no specification for stress assignment to a particular syllable. On the other hand, -ininkas is one of the most productive nominalizing suffixes in the language, and therefore the speaker should have a well-established notion of what to do with it accentually. At the same time, -ininkas is somewhat unusual with regard to other facets of the derivational process which will be discussed below (cf. section 4.9), so that perhaps it is felt by

the speaker to be in general different from other nominalizing suffixes. These conflicting bits of information contribute toward making it impossible to decide at this time exactly how to treat the accentuation of polysyllabic suffixes. More evidence is needed--perhaps a few more polysyllabic suffixes or the knowledge that these are the only two in the language or the intuitions of a native speaker.

3.6. For the purposes of the present paper, it will suffice to say that Lithuanian possesses some very early rule of suffix stress insertion (henceforth referred to as SSI) which inserts stress on the nominalizing suffixes and which may or may not specify that this stress be placed on the first syllable of polysyllabic suffixes. This rule is responsible for inserting stress on the great majority of nominalizing suffixes in the language but does not apply to Group B suffixes, which are marked as exceptions to it. Depending on the exact form of SSI, polysyllabic suffixes like -ininkas may either receive their stress by a minor rule or have underlying stress; either of these alternatives will produce the same result, while neither of them seems to make any especially desirable or undesirable claims. That is, at the time in the derivational process when whatever accentual interaction occurs between nominalizing suffixes and primary stems actually takes place, -ininkas, like the Group A suffixes, will already have stress of its own. Group B suffixes will remain stressless.

4.1. At the beginning of this section it was mentioned that because Lithuanian derived nominals exhibit three different types of accentuation, depending on the nominalizing suffix used, I would be trying to establish a corresponding triple accentual distinction between the derivational suffixes themselves. So far this has not been accomplished. At this point in the discussion, Group A and C suffixes enter into the derivational process already stressed, while Group B suffixes are unstressed. The reason for the accentual differences between forms derived with Group A suffixes and those derived with Group C suffixes is yet to be established. These differences will be explained in the following sections.

4.2. Assuming that when whatever interaction exists between primary stems and derivational suffixes takes place suffixes of Group A and C are already stressed, while those of Group B have no stress, it is necessary to consider exactly what the interaction between these suffixes and primary stems must be to produce derived nominals with the distribution of accentual properties described in Section III above.

4.3. Since it is apparently the case that the accentuation of the primary stem usually has little to do with determining the accentuation of nominals derived from it (i.e. the same stem combined with three suffixes will yield three derived nominals, each with a different type of accentuation (cf. triùšis (2) 'rabbit'; triušíena (1) 'rabbit meat'; triušenà (3) 'rabbit skin'; triùšininkas 'one who raises rabbits'.) and since it also turns out to be the case in all but a few instances (involving -ininkas) that stress, if it is present at all, occurs on the derivational suffix and not on the primary stem, it seems that the grammar of Lithuanian must contain some mechanism by which the primary stem loses its stress. Probably the most likely candidate for this job would be some type of left de-stressing rule--perhaps a rule which says that whenever there are two stresses present in a derived stem, de-stress the leftmost. Such a rule would work well for derived stems with Group A suffixes; however, difficulties arise immediately when one tries to use it to account for the accentuation of forms derived with Group B or C suffixes. Taking the latter group first (i.e. those with -ininkas) it becomes evident that, if the assumption that -ininkas already bears stress is to be maintained, then whenever the suffix is combined with a Class 1 or 2 stem a de-stressing rule will produce derived forms with accentuation which is exactly opposite to that which actually occurs. That is, by the use of a left de-stressing rule, a form derived from a Class 1 or 2 stem plus -ininkas will end up stressed on the derivational suffix, while in reality such forms are root-stressed. Obviously what would be needed to guarantee the correct output with Group C suffixes would be a rule which de-stresses to the right.

4.4. With nominals derived by the combination of Group B suffixes with the primary stem, neither a right nor a left de-stressing rule would be feasible. Obviously, if we are to maintain the tentative rule of SSI described above, and if Group B suffixes are to be marked as exceptions to that rule so that they have no stress at the time when they are supposed to interact accentually with the primary stem; then the environment for neither sort of de-stressing rule could possibly be met by forms derived with a Group B suffix.

4.5. Although one could conceivably say that these suffixes exceptionally condition left de-stressing, even minimal consideration indicates that this alternative is to be avoided at all costs. Intuitively, the character of a de-stressing rule is such that it operates only when its application accomplishes some function--for example when it avoids adjacent stresses or works to satisfy a one-stress-per-word type of constraint. However, to have Group B suffixes exceptionally condition the operation of such a rule amounts to claiming that anything can condition a de-stressing rule--in this case it just happens to be a derivational suffix, but there is no reason why it could not be the accusative singular ending or a dental stop--even though the application of the rule accomplishes no natural function. The desirability of such a claim is of course highly suspect. It seems therefore that something other than left de-stressing must be responsible for removing stress from primary stems combined with Group B suffixes.

4.6. It appears then that there is no reasonable way to use de-stressing to account for the elimination of primary stem accent in all three accentual types of derived forms; even though we might use a left de-stressing rule with Group A suffixes and a separate de-stressing rule which works to the right for forms with Group C suffixes (assuming that some way were found to justify using two such opposing processes to accomplish basically the same thing) there is no reasonable way a de-stressing rule could be made to work for derived forms with Group B suffixes. Therefore, it would not be unreasonable to abandon de-stressing rules and look elsewhere for an explanation of the apparent neutralization

of primary stem stress, in the hope that some other method can be found which might be able to capture some generalization about the process.

4.7. Since it seems that the accentuation of the derived form is in most cases determined by the accentual properties of the derivational suffix and apparently has little to do with the accentuation of the primary stem, and since it has been determined that there is no plausible way to use ordinary de-stressing rules to produce all three types of derived forms, it might be necessary to look for some de-stressing mechanism which itself is part of the derivational process, and which thus makes the use of separate de-stressing rules for each suffix type unnecessary. What I would propose at this point is the notion that perhaps when the derivational suffixation takes place, the accent of the primary stem is simply neutralized. Or, stated differently, whatever part of the grammar is responsible for pairing up primary stems with nominalizing suffixes to produce new derived forms (which are then fed into the regular process of derivation[13] as underlying forms) automatically cancels out the underlying accentuation of the stem. It must be noted, however, that if such a process exists, it must affect only stress and allow underlying tonal contrasts to be maintained: otherwise it would not be the case (as it is) that in all Class 3 derived forms, in those cases in declension where the surface word accent occurs on the first syllable, the surface intonation matches exactly that of the primary stem in declension. (e.g. vĩlkas (4) 'wolf': vilkenà (3) nom. pl. vĩlkenos 'wolfskin': mẽškė (2) 'bear'; mẽškinas (3) 'male bear').

4.7.1. The only motivation I can give for the choice of this particular mechanism (which will be referred to as Stem Accent Neutralization or SAN) is that it works. Where de-stressing fails to work at all, SAN serves nicely to account for why the accentuation of derived forms seems to be in most cases so completely independent of that of the primary stem. It works to get rid of the stress in stems which are combined with Group B suffixes to form Class 3 derived nominals (which have no underlying stress), a situation in which no kind of de-stressing rule could seriously be proposed. The only place where it does not work

is with forms derived by the affixation of -ininkas (or any Group C suffix, if others really do exist) and this problem will be discussed below.

4.7.2. There are a few observations about Lithuanian which might help to justify proposing a mechanism like SAN for this particular language. First of all, it seems from recent work on Lithuanian accentuation (Kenstowicz and Dudas and O'Bryan in this volume) that the language is equipped to handle at most one accent per stem underlyingly and one accent per word at the surface. At the word level, when multiply stressed nouns are produced by the addition of stressed endings to stressed stems, there is a rule, which Kenstowicz refers to as Stress Adjustment, which neutralizes all but the leftmost stress in the word. We shall see later that an identical rule may apply in the formation of prefixed nominals to eliminate all but the first stress (i.e. that on the prefix) in the word before the prefixed form enters ordinary phonological derivation as an underlying form and may in fact operate as a filter on all derived forms. These two rules for adjusting stress (Kenstowicz's Stress Adjustment, which is an ordinary phonological rule and the one exactly like it which applies to prefixed forms before they enter the phonological component) along with SAN appear to be part of a Lithuanian conspiracy to produce words with only one stress and, at a deeper level, to produce stems with at most one stress.

4.7.3. Secondly, after a stem has entered the derivational process, its underlying accentuation has in most cases no function which could not be taken over ty the accentual properties of the derivational suffix. In Lithuanian nominals, the presence or absence of underlying stress on nouns has no semantic import.[14] Apparently the only function underlying stress has is to determine what sort of accentual paradigm (mobile or immobile) will be produced for each word in declension. In derived forms however, there is always a derivational suffix present which either does or does not carry stress and it is conceivable that the presence or absence of stress on this suffix could serve the same purpose as the presence or absence of stress on the underived primary nouns

served. Since the only function stress on the primary stem has could be taken over by the derivational suffix accentuation, the presence of SAN in the derivational process functions to remove a possibly superfluous accent from the stem.

4.8. The reader will no doubt have noticed that even the presence of a mechanism like SAN within the process of derivation will not account for the accentuation of nominals derived by means of Group C suffixes such as -ininkas. It was noted above that for such forms a left de-stressing rule would have the effect of producing forms which are accentually just the opposite of those which actually occur whenever the suffix is combined with a Class 1 or 2 noun. In this respect, SAN acts no differently. If SAN actually does exist as part of the derivational process, then for some reason stems which are combined with Group C suffixes must not be submect to this primary stem de-stressing m mechanism. Although this causes difficulties, they are not unresolvable.

4.9. Recall that various difficulties concerning the accentuation of -ininkas were noted above in section 3.5.1, and it was revealed that this particular suffix is extremely productive in the language. It is so productive that a quick check of the dictionary reveals that for most nouns there is a form with -ininkas listed. This frequency of occurrence and productivity is of course the result of the extremely flexible semantic properties of the suffix. The semantic character of -ininkas is such that it may be combined with virtually any noun to indicate someone who somehow is connected with the noun the suffix appears with. However, the exact relationship between person and object may vary considerably:

áuksas (1) 'gold'; áuksininkas (1) 'goldsmith'

avìs (4) 'sheep'; aviniñkas (2) 'shepherd'

brostvà (2) 'brotherhood'; brõstvininkas (1) 'member of a brotherhood'

perkúnas (1) 'thunder'; perkúninkas (1) 'thunder worshipper'

This semantic variation is not present in words derived by the use of other suffixes. -enà for example always derives nominals meaning 'skin of X' where X is the noun it is combined with, or -íena always indicates 'meat of X'. In fact, rather than acting semantically like an ordinary

derivational suffix, -ininkas behaves more like an affix entering into composition with a stem, since in composition the semantic character of the newly formed word is never definitely predictable:

kója (1) 'foot'; pakója (1) 'footstool'

dujà (4) 'tiny particle'; padujà (3) 'very tiny particle'

laĩkas (4) 'time'; pãlaikas (3) 'the rest, the remainder'

Therefore, what might be suggested is that -ininkas is not felt by the speaker to be an ordinary derivational suffix. If this is true, then the fact that the primary stems with which -ininkas is combined are not subject to SAN is not remarkable. As we shall see later, forms derived by the use of -ininkas may not be subject to any rules which are specifically connected with derivation and actually are accentually derived by the application of the same rule which seems to derive many prefixed forms.[15]

4.9. It should also be mentioned here that in case the suffix -imas/-ymas used to form gerunds should (as I suspect it will) actually turn out to be like -ininkas in that it belongs to Group C, it would also have to be somehow exempt from SAN. In the case of -imas/-ymas this would not be difficult to explain. Since it forms gerunds, this suffix of course occurs only with verb stems. In verb stems however, the presence or absence of root accent is closely connected to semantic considerations; and consequently, the loss of this accent which would occur through the operation of SAN could cause considerable semantic ambiguity for the speaker. Therefore it is not surprising that such a suffix would behave in the same way as -ininkas with respect to accent, maintaining the original accentuation of the stem (i.e. the suffix itself appears accented only when the primary stem had no underlying stress.)

4.10. Even assuming that Group C suffixes justifiably do not cause the primary stems with which they are combined to be de-stressed by SAN, one must still account for the removal of the accent from the derivational suffix when the primary stem is Class 1 or 2. It was suggested above that perhaps derived forms with -ininkas were semantically similar to compounds formed by the addition of a prefix to a primary stem. It

might therefore be possible that it resembles these forms accentually also. In order to determine whether this is true, it will be necessary to examine the accentuation of prefixed nouns.

5.1. There are several nominal prefixes which occur in Lithuanian, and these prefixes are much like the nominalizing suffixes in their distribution and occurrence. That is, nominal prefixes of course occur only with nouns or adjectives, but each one may occur with nouns or adjectives of any accent class. As is the case with derivational suffixes, more than one prefix may occur on a word, multiple prefixes probably representing repeated compoundings.

5.2. For all nominal prefixes except pa- (which will be discussed below) composition with a primary noun or adjective results in a new compound form of Accent Class 1, where the word accent is on the prefix. This happens regardless of the original accentuation of the primary form. For example:

brólis (1) 'brother'; póbrolis (1) 'stepbrother'

stãlas (2) 'table'; apýstalė (1) 'group of people seated at a table'

dárbas (3) 'work'; pódarbis (1) 'the time immediately after hard work'

aušrà (4) 'dawn'; príeaušris (1) 'the time immediately before dawn'

5.3. The case is somewhat different for pa-. If this prefix is combined with an immobile Class 1 or 2 noun,[16] then the accentuation of the prefixed form will be exactly the same as that of the unprefixed form. (e.g. kója (1) 'foot'; pakója (1) 'footstool') On the other hand, if pa- is affixed to a mobile Class 3 or 4 noun, the new prefixed form will also be mobile (Class 3) with its accent in declension alternating between the prefix and the ending. In other words, prefixing a form with pa- does nothing to the original accentuation of that form; if it originally had an underlying accent, that accent remains; if it originally had no accent (i.e. was mobile) and therefore received word-stress only through the operation of a rule which assigns stress to the first syllable of mobile words in declension (cf. Kenstowicz), then the affixation of pa- does nothing to change this.[17] The fact that in prefixation the newly prefixed morpheme pa- becomes the first syllable of the word accounts for

why in prefixed mobiles the accent appears to alternate between the prefix, which is now the first syllable, and the inflectional ending.

5.4. At this point, as before with the nominalizing suffixes, it is again necessary to determine the underlying accentuation of the prefixes themselves so that we can go on to discuss the accentual interaction between prefix and noun. It seems evident that accentually, all the nominal prefixes except pa- must be very similar to the derivational suffixes of Group A. That is, it is also true of these prefixes that no matter what the accentuation of the noun with which they are combined, the accent of the new stem is always immobile on the prefix For this reason, one might again want to say that an accent must then be present on the prefix in its underlying representation. This however causes the same problem which was encountered with the Group A suffixes. Since it is the case in almost every instance of prefixation (of primary nouns) that the suffix receives the word-accent, it would seem reasonable to capture this generalization by assigning accent to the prefix by a rule in order to indicate that accent on the prefix is not something which the speaker memorizes for each prefix separately. pa-, since it never receives stress by this rule,[18] which will be referred to as Prefix Stress Insertion or PSI, will have to be marked as an exception--just as Group B suffixes were exceptions to SSI.

5.5.1. Because there are at least two polysyllabic prefixes in Lithuanian (apý- and tarpù-) the rule PSI might have to specify that the accent must be placed on the second syllable of the prefix. Although apý- does not really necessitate this, since in this specific instance the synchronic reflex of De Saussure's Law (cf. Kenstowicz) could be responsible for causing the accent to shift from an original position on the first syllable to the following high pitched syllable, for tarpù- it is not likely that this could be the case; so that it seems reasonable to assume that PSI does indeed specify that accent be assigned to the rightmost syllable of the prefix.

5.6. As in the discussion of nominalization above, the problem again arises of how it happens that for prefixes in general the accent of the primary noun appears to get deleted, making the prefix-accent

serve as the stem-accent. There are a couple of ways in which this could come about, but the first thing that suggests itself is that perhaps whatever part of the grammar is responsible for composition[19] has some mechanism corresponding to SAN of the derivational process. All the observations which were made concerning derivation and SAN above are valid for prefixation also. However, in derivation it appears that there is no other way to account for what happens to underlying stem accents besides assuming the existence of a powerful mechanism like SAN, since using de-stressing rules leads there to numerous complications and makes undesirable claims about what de-stressing rules can do. In discussing prefixation however, it is not necessary to resort to a radical mechanism like SAN, since more conventional methods seem able to account for the neutralization of stem accents in prefixed forms.

5.7. A quick glance at how the accentuation of prefixed forms is related to that of the corresponding unprefixed forms reveals that a rule of Right De-stressing would work in every case to produce prefixed forms with the correct accentuation. Such a rule would however have to specify that there is no limit on the number of intervening syllables between the prefix and the stem accent, since Class 1 or 2 stems may be polysyllabic with underlying stress in any syllable of the stem. The fact that the environment for Right De-stressing may not specify contiguous stresses (and therefore doesn't function specifically to eliminate adjacent stresses) indicates that the sole purpose of this rule is to guarantee at most one stress per stem (which in this case occurs on the prefix). It will be recalled however, that there is already an identical rule on the word level (Stress Adjustment) which accomplishes exactly the same thing--except of course at a higher level. This rule specifies the deletion of all but the leftmost stress in any word which has acquired multiple stresses by the addition of a stressed inflectional ending to an underlyingly stressed stem. To have a rule of Right De-stressing included in the process of prefixation and to have a rule of Stress Adjustment which is apparently identical in function and claims operating as an ordinary phonological rule seems

suspicious. It might be more reasonable to assume that, in keeping with a possible Lithuanian constraint against multiple stresses on stems and words, there might be only one rule of Stress Adjustment which applies at the end of any sort of derivational process (i.e. the end of prefixation, nominalization, and ordinary phonological derivation) and which acts as a sort of filtering device to adjust any stems or words which have acquired multiple stresses in the process of derivation.

5.8. Assuming then that a rule such as Stress Adjustment applies at the end of prefixation, the derivation of prefixed forms from immobile and mobile stems would be something like the following, where pre represents all prefixes except pa- and CVC represents a stem with an unspecified number of syllables:

| | | -PSI | | -PSI |
|---|---|---|---|---|
| | pre+CV́C | pa+CV́C | pre+CVC | pa+CVC |
| PSI | pré+CV́C | -------- | pré+CVC | -------- |
| SA | pré+CVC | -------- | -------- | -------- |
| | pré+CVC | pa+CV́C | pré+CVC | pa+CVC |

5.9. Getting back to the problem which was mentioned in section 4.9 involving the accentuation of derived nominals ending in -ininkas, it was observed that the use of this suffix may be felt by the speaker to result in something like a compound stem rather than in a true derived stem. That is, it might be felt that what happens to a stem when -ininkas is added is semantically more similar to what happens to it in composition than it is to what happens when a true derivational suffix is added. For this reason -ininkas might not be felt to be a derivational suffix at all and therefore the stems with which it is combined would not be subject to SAN. However, assuming that -ininkas itself is already accented,[20] then its addition to Class 1 or 2 stems would create derived forms with multiple stresses. It is possible that in order to get rid of such forms the filtering rule SA applies at the end of the derivational process to eliminate all but the leftmost stress. Then the derivation of forms with -ininkas would simply be

| | | |
|---|---|---|
| | CV́C+ininkas | CVC+ininkas |
| SA | CV́C+ininkas | CVC+ininkas |

yielding for example áuksininkas (1) 'goldsmith' from áuksas (1) 'gold'

but avinĩkas (2) 'shepherd' from avìs (4) 'sheep'. Thus, unlike those formed with other derivational suffixes, forms with -ininkas end up being subject to only the filtering rule of Stress Adjustment. In this way they are by accident accentually more like forms derived by pa- prefixation than they are like those derived by suffixation.

6.1. It was mentioned at the beginning of this paper that derived nominals with more than one derivational suffix (therefore probably representing more than one pass through the derivational process) can occur in the language. Derived prefixed forms can also occur, some of them containing more than one prefix. The remainder of the present paper will be devoted to considering the rules which have already been posited in light of the accentuation of these additional prefixed and derived forms to see whether any new evidence will be presented which requires the elimination or adjustment of any of the above rules or the addition of any new machinery. The tentative rules suggested so far for derivation and prefixation are listed below for convenience:

6.1.1. Derivation:

| | |
|---|---|
| SAN | Whenever derivation takes place, de-stress the primary stem. |
| SSI | Stress the first syllable of the derivational suffix. |

6.1.2. Prefixation:

| | |
|---|---|
| PSI | Stress the rightmost syllable of the prefix |

6.1.3. At the end of all types of derivation:

| | |
|---|---|
| SA | Delete all but the leftmost stress. |

6.2. It is in my opinion reasonable to assume that the Lithuanian process of derivation adds one suffix each time it applies. Therefore, forms with multiple suffixes must have gone through derivation more than once. Using the derivational apparatus which has tentatively been assumed, it can be predicted that each time a new Group A suffix is added, the old derived stem (which includes the suffix which was added in the first pass through derivation) becomes the new primary stem and automatically loses its accent by SAN. Then a new suffix is added and

will receive stress by SSI. This is exactly what occurs, as is evidenced by forms such as

tḗvas (1) 'father'; tėvùlis (2) 'little father'; tėvulẽlis (2) 'dear little father'

paũkštis (2) 'bird'; paũkštininkas (1) 'one who raises birds'; paukštininkỹstė (2) 'the raising of birds'

valdinỹs (3) 'subject (of some higher authority)'; valdiniñkas (2) 'official'; valdininkíenė (1) 'wife of an official'; valdininkijà (2) 'the state of being an official'

A sample derivation of tėvulẽlis from tḗvas would be

I $\overset{X}{\text{tėv-}} \xrightarrow{SAN}$ tėv+ulis $\xrightarrow{SSI}$ tėv+$\overset{X}{\text{ùlis}}$ ---> tėvùlis[21]

II $\overset{X}{\text{tėvùl-}} \xrightarrow{SAN}$ tėvul+ėlis $\xrightarrow{SSI}$ tėvul+$\overset{X}{\text{ėlis}}$ ---> tėvulẽlis

When the first of multiple suffixes is -ininkas the following derivational steps occur. (Recall that -ininkas does not condition SAN)

I $\overset{X}{\text{paũkšt-}}$ ---> $\overset{X}{\text{paũkšt}}$+$\overset{X}{\text{iniñkas}} \xrightarrow{SA}$ $\overset{X}{\text{paũkštininkas}}$ ---> paũkštininkas

II $\overset{X}{\text{paũkštinink-}} \xrightarrow{SAN}$ paukštininkꞏystė $\xrightarrow{SSI}$ paukštininkꞏ$\overset{X}{\text{ỹstė}}$ ---> paukštininkỹstė

When -ininkas is the rightmost of multiple suffixes, the same tentative apparatus predicts that if the next-to-last suffix is one belonging to Group A it will retain its accent even though a new suffix has been added. This is exactly what happens:

sẽnas (4) 'old'; senỹbė (2) 'antiquity'; senỹbininkas (1) 'antiquarian'

sègti 'to stick something on with a pin'; segtùkas (2) 'pin'; segtùkininkas (1) 'maker of pins'

6.3. Even though it is true that whenever any prefix except pa- occurs with a primary stem the prefix is accented, when such a prefixed form goes through the derivational process and receives a nominalizing suffix, the derivational suffix, if it belongs to Group A, ends up bearing stem-stress. For example

príešgyna (1) 'shrew'; priešgynỹstė (2) 'shrewishness'

ùžgiris (1) 'area on the other side of a woods'; užgiriẽtis (2) 'someone who lives on the other side of the woods'

apýsaka (1) 'story'; apysakẽlė (2) 'short story'

If the suffix belongs to Group C, forms like the following occur:

prievolė (1) 'duty'; prievolininkas (1) 'someone who is committed to perform a duty'

pódelis (1) 'storeroom'; pódelininkas (1) 'one who is in charge of a storeroom'

This is exactly what is predicted, since -ininkas, not being felt to be a true derivational suffix does not condition SAN. This allows the underlying stem-stress to remain on the prefix. Since the suffix itself has an accent, this creates stems with two stresses. Stress Adjustment then applies to eliminate all but the leftmost stress, which is on the prefix.

6.4. When the primary stem contains the prefix pa-, the derivational apparatus predicts that the addition of a Group A suffix would produce a derived form with stress on the suffix--since SAN applies to remove any stress the primary stem might have had and pa- itself never received stress by PSI. The addition of a Group C suffix to a prefixed stem with pa- should produce derived forms with accent on the original primary stem if that stem was Class 1 or 2 and on the derivational suffix if the original stem was Class 3 or 4. Once again, as evidenced by the following forms, the tentative apparatus produces the correct results:

pakálnas (3) 'mountain'; pakalnė́nas (1) 'one who lives on a mountain'

pakapẽ (3) 'place near a grave'; pakapỹnė (2) 'area around the cemetary'

pagálba (1) 'aid, assistance'; pagálbininkas (1) 'helper'

pajamà (3) 'income'; pajaminiñkas (2) 'cashier'

6.5. As was shown above, it is true that with all prefixes except pa-, whenever prefixation of a primary stem occurs, the accentuation of the new form is invariably immobile on the prefix. It might seem reasonable to expect then that with prefixed derived forms (when the case is actually one in which a prefix is added to a stem which has already gone through the derivational process of suffixation) the same thing would occur because the filtering rule always operates to remove all stresses in the new stem except the one on the prefix. However, this does not occur--or at least the dictionary lists no forms where this appears to

have occurred. If this lack of derived forms which have been prefixed is not just an accidental omission by the lexicographers, then there are two possibilities: either the entire analysis I have presented so far is completely or at least partly incorrect or there exists some sort of interaction between the two processes of derivation and prefixation (or perhaps they are not distinct from each other at all). Since our tentative apparatus seems to work reasonably well for a great many different types of derived forms, I would suspect that the latter possibility is the more probable. If it turns out to be true either that there is some accentual interaction between prefixation and derivation or that the two are actually one and the same process, the implications would be significant for any further work on Lithuanian derivational morphology; however, I think that what has been included in the present paper would remain more or less unchanged. For this reason I will say no more about the problem and go on to discuss the accentuation of stems with more than one prefix.

6.7. When stems with more than one prefix occur, it is reasonable to suppose that, as with suffixes, the multiple prefixes have been acquired by more than one pass through the composition process. Therefore, one might expect that as long as neither of the prefixes is pa- the leftmost would always be accented. This is what does happen:

kuĩnis (4) 'heel'; užkulnis (1) 'the back part of a heel';
póužkulnis (1) 'under-part of a heel'

vaikáitis (1) 'grandchild'; próvaikaitis (1) 'great grandchild';
próprovaikaitis (1) 'great great grandchild'

Something which is thoroughly surprising however is the fairly frequent occurrence of multiple-prefixed nouns like the following:

durỹs (2) 'door'; taŕpduris (1) 'doorway'; pãtarpduris (1)
'place in front of the doorway'

pẽlenas (3) 'open hearth'; ùžpelenis (1) 'place behind the
hearth'; pãužpelenis (1) 'area in the vicinity of the hearth'

Notice that, when it is the first of two prefixes, pa- gets an immobile accent and receives word stress. This is of course not at all what one would expect pa- to do in such cases; based on its general behavior and

the derivational rules suggested so far; this prefix would be expected to leave the accent on the first prefix (i.e. the one added in the first trip through the prefixation process) so that the accentuation would be *patarpduris and *paužpelenis. The fact that even pa- receives stress when it is the first of multiple prefixes indicates that, even though the mechanisms which have already been suggested would suffice to produce forms like pózkulnis, the rule which inserts stress on prefixes (PSI) will have to be revised. Recall that originally pa- was marked as an exception to this rule. In its revised form PSI will now have to look something like the following:

(Revised) PSI prefix ---> +stress /___+ prefix + stem

while pa- will be marked as an exception to PSI only if no other prefix is present between it and the stem. In this revised form PSI will be able to produce the correct accentuation for nominals with any number of prefixes.

6.8. The reader has undoubtedly noticed several gaping holes in the data presented in this section. Namely, there occurred no examples of forms derived from prefixed stems by the addition of Group B suffixes; nor were there any examples of what happens to Group B suffixes in repeated passes through the derivational mechanism. One might predict that both the former and the latter derived forms would be of Accent Class 3 if the Group B suffix were the rightmost, Class 1 or 2 if a Group A suffix were rightmost, or Class 1 or 2 of a Group C suffix were rightmost, but further evidence is needed.

6.8.1. Furthermore, there have been no examples of forms with multiple (i.e. more than two) prefixes and multiple suffixes, nor are they likely to be found in any available dictionary. Such complex forms would probably come only from a native speaker asked specifically to construct them.

FOOTNOTES

[1] In the following discussion the description of Lithuanian nominal accentuation which appears in Kenstowicz's contribution to this volume will be followed. The reader's familiarity with this description is presupposed and quite necessary for comprehension of the present paper.

[2]Actually these are surface representations, while the derivational process probably operates on underlying representations. However, for simplicity, forms will be given in their segmental surface forms, while stress will be marked by x where it must appear in the underlying representation.

[3]Throughout the paper I use "primary stem" to refer to that stem which is undergoing the derivational process (i.e. that stem to which a derivational suffix is added). However, this stem may or may not be primary in the usual sense. That is, since, we shall see later, derivation can take place by the addition of a suffix to a stem which has itself been derived by the suffixation process, sometimes what I refer to as the primary stem is in fact derived and already contains at least one derivational suffix.

[4]Forms with more than three suffixes do not occur in the dictionary, but, in my opinion, it is probable that a speaker asked to do so could construct a word containing four or more suffixes.

[5]The suffix occasionally occurs as -inkas when it is combined with polysyllabic stems ending in n.

[6]The glosses for diminuitive forms are approximations, included only to give the reader some idea of their meaning. Lithuanian diminuitives are not, strictly speaking, directly translatable into English.

[7]It might be noted that it is probable that there are certain restrictions on where, in a line of multiple suffixes on one word, this particular suffix can occur. While there are numerous instances of such words where -ininkas is the first (i.e. leftmost) suffix in a string, I could find very few examples where it was the last. It is likely that such ordering restrictions exist for other suffixes too without my being aware of them.

[8]There may exist a very limited number of suffixes for which, in order to predict the place of accent for immobile derived nouns, it is necessary to know the underlying accentuation of the primary stem. This will be discussed in detail below.

[9]Numbers in parentheses refer to accent class.

[10]All suffixes mentioned in this paper come from Senn 1966, while all forms may be found in Niedermann 1968. Throughout the paper, suffixes will be cited as they appear in declension with the nominative singular ending. Most which appear with masculine endings have corresponding feminine endings also.

[11]Naturally no noun derived by suffixation could belong to Class 4, since membership in that class is a priori restricted to monosyllabic stems.

[12]The segmental form of the suffix varies, depending on the verb stem to which it is affixed.

[13]Here "the process of derivation" refers to the ordinary phonological process by which underlying forms are converted to surface structures.

[14]This is in contrast to verbs, where underlying stress (or stress assigned at the very beginning of derivation) is significant semantically. (cf. Dudas and O'Bryan in this volume.)

[15]The reader should not assume from this that the speaker feels -ininkas to form compounds. It is undoubtedly accidental that the same rule applies to forms with -ininkas and those with certain prefixes. This will become clear later in the paper from the character of the rule involved.

[16]In the discussion which follows, everything said concerning the prefixation of nouns also applies to prefixed short-form adjectives.

[17]It might be helpful at this point, in order to avoid possible confusion later, to emphasize the fact that the accentual relationship which exists between a simple stem and the form of that stem which includes the prefix pa- differs significantly from the accentual relationship which exists between a primary stem and the corresponding derived form with -ininkas. That is, the form of a stem which appears with pa- always has the same sort of accentuation (mobile or immobile) as the unprefixed form of the stem, and it is also true that when -ininkas is added to an immobile (Class 1 or 2) stem, the derived form will also be immobile. However, when -ininkas is affixed to an accentually mobile stem, the derived form is always immobile Class 2, with stress remaining fixed on the derivational suffix.

[18]Although pa- is stressed sometimes in declension, that is the result of a phonological rule mentioned above which causes the alternation of accent between first syllable and inflectional ending. Everything relevant to the present discussion takes place before ordinary phonological rules may apply; i.e. at the end of the compounding process under discussion, a prefixed stem is produced which is then used as the input for the phonological rules.

[19]It is possible that it could be the same part which is responsible for derivation. However, at the present so little is known about either that it is impossible to decide whether they are actually separate or not; but for the purposes of the present paper and until further investigation is made, I will be assuming that derivation and composition are separate processes.

[20]It was noted above in section 3.5 that it might be assumed either that -ininkas has underlying stress or that it receives it by a minor rule which inserts stress on the second syllable of certain polysyllabic derivational suffixes. If -ininkas is not felt to be a true derivational suffix, then the former alternative becomes somewhat preferable to the latter. (Although there are no overwhelming advantages to either.) Thus, for want of conclusive evidence either way, I will assume that -ininkas is marked for stress in the underlying representation.

[21]This step includes various rules which produce surface intonation from deeper combinations of tone and stress.

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# THE BALTIC ē-PRETERIT: AN OLDER ā-PRETERIT?[1]

by

Hans Henrich Hock

0.1: In Lithuanian, and in Baltic in general,[2] two overt preterit markers can be found: *-ā- > Li. -o- and (*) -ē-. Two subvarieties of the latter suffix are frequently distinguished, which will in the following be referred to as $\bar{e}_1$ and $\bar{e}_2$. The suffix $\bar{e}_1$ occurs in the preterit of verbs whose stem ends in -y- in the infinitive and *-ā- in the present, and whose preterit (active) participle shows palatalization of the presuffixal consonant; cf. inf. laik-y-ti 'hold', pres. 3rd pers. laik-o, pret. laik-ē, pret. pple. laikius- (= [laik'us-]). The suffix $\bar{e}_2$ is found in the preterit of all other verbs which have ē-preterits, notably in the preterit of most *-ja-verbs; cf. peik-ti 'reproach', peik-ia, peik-ē, peik-us- and deg-ti 'burn', deg-a, deg-ē, deg-us-.

0.2: Concerning the historical origin of these two types of ē-preterits, numerous different hypotheses have been advanced. Among these hypotheses, three major views can be discerned.

0.2.1: According to one view, dating back to Schleicher (1856:224-5) and continued by Kurschat (1876:280), Vaillant (1942:156-7),[3] Schmalstieg (1960:265-6),[3, 4] and Schmid (1963:19-22),[3] all ē-preterits, both those in $-\bar{e}_1-$ and those in $-\bar{e}_2-$, are a Baltic innovation, ultimately deriving from earlier formations containing the preterit marker *-ā- overtly found in the other Baltic preterits (other than that of the verb 'to be' where such forms as OLi. and dial. Li. bit(i) can be found).

0.2.2: A second view, first advocated by Wiedemann (1891:181-7) and found also in Pedersen 1921 and 1926:11-2, as well as in Stang 1966:382 and 387-8, overlaps with the preceding view by considering the forms with suffix $\bar{e}_1$ to be derived from earlier formations in -ā-. However, as far

as the suffix $\bar{e}_2$ is concerned, this view maintains that it is inherited from Proto-Indo-European.

0.2.3: The third major view implicitly or explicitly rejects the hypothesis that one or both of the two $\bar{e}$-preterits can be derived from earlier $\bar{a}$-preterit formations and considers all $\bar{e}$-preterits, both those in $-\bar{e}_1-$ and those in $-\bar{e}_2-$, to be inherited from Proto-Indo-European. This view has been held by such linguists as Endzelīns (1923:666 and 1971: 234), Sandbach (1930:81-2), Stang (1942:189), and Kølln (1969:31-2).[5]

Also Kazlauskas (1968:360) rejected the view that the $\bar{e}$-preterit can be derived from earlier preterit formations in $*-\bar{a}-$. Unlike the other linguists of this group, however, he seems to have been of the opinion (ibid:348) that the ending of the $\bar{e}$-preterit (as well as that of the $\bar{a}$-preterit) constitutes an inner-Baltic innovation, deriving from earlier uninflected, noun-like present forms in $-\bar{e}$ (and $-\bar{a}$). When these forms later 'acquired' personal (present) endings (as in *auklē* → *auklē-ja*), the older, noncharacterized forms became specialized as preterits.

0.3: Rather than discussing the relative merits of all of these three major views and of their manifold subvarieties, I will in this paper narrowly limit myself to investigating the pros and cons of what appears to me the most fruitful hypothesis, namely the first major view (and the second major view in so far as it overlaps with the first). In so doing I hope to demonstrate that, with modifications, elaborations, and ancillary hypotheses, many of which were considered by previous investigators without however reaching what I feel to be the correct conclusions, this view can be shown to be plausible and thus at least to be a viable alternative to the other major view(s).

1.1: Before entering into a discussion of the first major view, however, it will be useful to have a brief look at the synchronic nature of the data under discussion.

1.2: With only minor exceptions which would not affect the thrust of the arguments of this paper, the Standard Lithuanian distribution of the two preterit suffixes, *-ā- and -ē-, is as indicated in table 1.

TABLE 1

| | INFINITIVE | PRESENT | PRETERIT | PRETERIT PARTICIPLE |
|---|---|---|---|---|
| (a) | -y- | *-ā- | -ē- | *-jus- |
| (b) | -Ø- | *-ja- | -ē- | -Ø-us- |
| (c) | -Ø- | -a- | -ē- | -Ø-us- |
| | -Ø- | -a- | *-ă- | -Ø-us- |
| (d) | -Ø- | -N ... a- | *-ā- | -Ø-us- |
| | -Ø- | -sta- | *-ā- | -Ø-us- |
| (e) | -V- | -V-j-a- | *-V-j-ā- | -V-j-us- |

1.2.1: In class (a), exemplified by verbs like laik-y-ti 'hold', laik-o, laik-ē, laikius-, the preterit suffix is -ē- without any exceptions. Both transitive and intransitive verbs occur in this class.

1.2.2: Also in the almost exclusively transitive verbs of class (b), such as peik-ti 'reproach', peik-ia, peik-ē, peik-us-, the preterit suffix regularly is -ē-, only four or five exceptions with *-ā- being found. This class of verbs is, if not very productive, at least very large.

1.2.3: In classes (d) and (e), the ā-preterit is regularly found.

In type (e), exemplified by verbs like pasak-o-ti 'tell stories', pasak-o-j-a, pasak-o-j-o, pasak-o-j-us-, the ā-suffix is the exclusive preterit marker. Verbs of this type may be either transitive or intransitive, depending to a certain degree on the precise long-vowel stem-forming suffix chosen. Note that the -j- found between the long-vowel suffix and the markers of the present, preterit, and preterit participle is, from the synchronic point of view, best regarded to function as a hiatus breaker. For there is in Lithuanian a general con-

spiracy of various different rules which leads to the elimination of vowel clusters consisting of more than two morae; cf. my other paper in this volume.

In the verbs of type (d), such as ak-ti 'become blind', a-n-k-a (with nasal infix), ak-o, ak-us- and dyg-ti 'sprout', dyg-sta, dyg-o, dyg-us-,[6] the ā-preterit occurs with virtually no exceptions. The verbs of this class are invariably inchoative-intransitive.

1.2.4: It is only in the verbs of class (c), such as deg-ti 'burn', deg-a, deg-ē, deg-us- and lik-ti 'leave', liek-a, lik-o, lik-us-, that both ā- and ē-preterit occur quite freely, although the occurrence of one or the other type of preterit formation is largely predictable in terms of root shape and/or in terms of whether the root ablauts and what kind of ablaut it undergoes. The regular distribution of endings is as indicated in table 2.

No exceptions seem to occur in subclasses (ii), (iii), (v), and (vii) - (x).[7] Exceptions are rare in classes (i), where isolated ē-preterits like muš-ē 'defeated' are found, and (vi), where mezg-ē 'tied' and rezg-ē 'knitted' are the only exceptions. Note that because of their close semantic similarity and because of the fact that they rhyme, the two exceptions to subclass (vi) can be considered to be really only a single exception.

It is only in subclass (iv), which is extremely limited in number, that the selection of the preterit marker is formally indeterminate. Of the four verbs which belong to this class, namely aug-ti 'grow (itr.)', sēs-ti (from /sēd-ti/) 'sit down', ēs-ti (from /ēd-ti/) 'eat (of animals)', and pul-ti (from /puol-ti/) 'fall' and 'überfallen, attack', two have ā-preterits (aug-o and sēd-o) and the other two have ē-preterits (ēd-ē and puol-ē).

1.2.5: Note that while in the majority of subclasses of class (c), transitive verbs are preponderant, there is still in each of these subclasses a sufficient number of intransitive verbs to preclude labeling class (c) a class of transitive verbs.

What is interesting in respect to the transitivity : intransitivity distinction is the fact that in the small subclass (iv), the occurrence of ā- or ē-preterit can be considered linked with the (potential) transitivity of the verbs: The two verbs which are always intransitive (aug-ti and sēs-ti) take the ending *-ā-, while the two verbs which are (or can be) transitive (ēs-ti and pul-ti) take the ending -ē-. The significance of this fact will become apparent later on when the evidence of Old Lithuanian, of the Lithuanian dialects, and of (the) Latvian (dialects) is taken into consideration.

TABLE 2

| | ROOT SHAPE | ABLAUT | PRETERIT |
|---|---|---|---|
| (i) | {ĭ, ŭ} + {RC, C} | --- | *-ā-; cf. lip-o 'climbed' |
| (ii) | {ĕ, ă} + C | --- | -ē-; cf. deg-ē 'burned' |
| (iii) | ă + R | --- | -ē-; cf. bar-ē 'scolded' |
| (iv) | {V̄, VV} + {C, R} | --- | indeterminate; cf. aug-o 'grew' vs. ēd-ē 'ate' |
| (v) | Vnd | --- | *-ā-; cf. kand-o 'bit' |
| (vi) | VCC | --- | *-ā-; cf. čiauš̌k-o 'stuttered' |
| (vii) | VR | V → V̄ | -ē-; cf. myn-ē 'stepped', pres. min-a |
| (viii) | ĕ(R)C | ĕ → ∅ | *-ā-; cf. lik-o 'left', pres. liek-a |
| (ix) | ĕR | ĕ → i | -ē-; cf. gim-ē 'was born', pres. gem-a |
| (x) | ĭ | ĭ → ē | -ē-; cf. ēm-ē 'took', pres. im-a |

1.3: Thus, verbs which are clearly phonologically marked for transitivity (class (b)) or intransitivity (class (d)) have, with but four or five exceptions on either side, completely predictable preterits. The transitive type has the suffix -ē-; the intransitive type, the suffix *-ā-.

1.4: In addition, there is in these verbs a formal correlation between the present and preterit suffixes: The nonpalatal present suffix -ă- corresponds to the nonpalatal preterit suffix *-ā-, while the palatal present suffix *-ja- corresponds to the palatal preterit marker -ē-. (This correlation, of course, breaks down in the verbs of class (c), where both palatal ē-preterit and nonpalatal ā-preterit can be found corresponding to the nonpalatal present suffix -ă-.) A similar formal relation seems to exist in class (a), where the palatal infinitive stem marker -y- corresponds to the palatal preterit marker -ē-.

1.5: Another generalization can be made about the verbs which have a long-vowel derivational suffix in the infinitive (classes (a) and (e)). For also here the selection of the preterit marker is predictable. Verbs of class (a), with the infinitive marker -y- and the present suffix *-ā- > -o-, have ē-preterits; all other verbs of this type have ā-preterits.

However, while in class (e) the preterit marker *-ā- is added to the infinitive suffix, with an intervening -j- to bridge the hiatus between the two vocalic suffixes, in class (a) the preterit marker -ē- seems to replace the infinitive suffix -y-. Notice that no other verbal category with characterized infinitive shows such a pattern of suffix replacement, or an ē-preterit for that matter. Class (a) thus is quite aberrant in this respect.

Class (a) is equally aberrant in the formation of the preterit participle. While all the other verbs look like they drop (without trace) the suffix of the preterit (whether this be *-ā- or -ē-) before the suffix-initial vowel of the preterit marker -us-, class (a) verbs do not seem to lose their preterit suffix without trace. For a reflex of the palatal quality of the preterit suffix -ē- seems to appear in the

palatalization of the root-final consonant preceding the preterit marker -us-; cf. class (a) laik-ē : laikius- vs. (b) peik-ē : peik-us-, (c) deg-ē : deg-us-.

2.1: It is the correlations between the palatal present or infinitive suffixes (*-ja- and -y-) and the palatal preterit suffix -ē- noted in 1.4 above which formed the basis for the hypotheses that all ē-preterits can be derived from earlier formations characterized by the preterit marker *-ā-.

2.1.1: Thus Schleicher (1856:66-7, 157, 224-5) proposed to derive the ē-suffix of class (a) preterits from an earlier combination of the infinitive marker -y-[8] and the preterit marker -ā-,[9] which developed into an intermediate -jā-; similarly he proposed to derive the ē-suffix of (b) and (c) preterits from earlier -jā- whose j he apparently identified with the -j- of the ja-presents to which -ē- regularly corresponds in the preterit; cf. 1.2.2 above. Both of these jā-suffixes then in his opinion contracted to -ē-.

Schleicher no doubt felt justified in this assumption by the fact that a similar process of contraction of *-jā- to -ē- can in his view be found in nouns of the type žemē 'earth', where the older *-j- clearly shows up in the palatalization of the root-final consonant in the genitive plural žemių and where dialectal vacillation in such forms as the genitive singular between noncontracted -ios (< *-jā-) and -ės indicates that *-jā- does indeed (optionally) contract to -ē- (1856:67, 107, 184-6).

2.1.2: In his view Schleicher was closely followed by Kurschat (1876: 34, 172-3, 280-1). However, being a native speaker of the language, Kurschat also adduced evidence which at the time, to be sure, was not yet felt to be of any particular significance, but which took on crucial importance once the concept of the regularity of sound change had become generally accepted.

For, as Kurschat pointed out, beside contracted nominal forms like žemē, Lithuanian also offers forms which show no contraction throughout

the paradigm, such as valdžia, G sg. valdžios 'rule, power'. In addition, Kurschat correctly observed that while the preterit participle of class (a) verbs shows palatalization of the root-final consonant, the preterit participles of class (b) and (c) verbs do not; cf. 1.5 above.

2.2.1: Schleicher's (and Kurschat's) view was first attacked by Wiedemann (1891:181-3).

According to Wiedemann, it is difficult to see how the ē-preterit of class (c) verbs can be derived from an earlier preterit in *-jā-, with the -j- of the present suffix *-ja-, since the present suffix of class (c) verbs is precisely not *-ja-, but rather -a-.

In addition, Wiedemann argued, even if one were to accept the hypothesis that all ē-preterits can be derived from earlier forms in *-jā-, why is the preterit of class (b) presents like bliau-ja 'cry' of the shape bliov-ē, rather than the expected bliau-jo*, with the regular diphthongal root alternant before j (cf. the form of the present) and with the regular lack of contraction of *-jā- after vocalic segments (cf. sē-ja < *-jā 'sowing')?

Further, following Johannes Schmidt,[10] Wiedemann argued that the nominal forms in contracted -ē- cannot be considered derived from the attested uncontracted forms in *-jā- (> -io- or -ia- depending on the environment), but that they are to be derived from earlier, contrasting forms in *-ijā-, with PIE *-iy-, rather than simple *-y-. And while it would still be entirely possible, from a purely phonological point of view, to derive the ē-preterit of class (b) and (c) verbs[11] from older formations in *-ijā-, there would in his opinion be no morphologically satisfactory way of explaining the origin of the -ij- of this suffix.

2.2.2: Although Wiedemann's arguments concerning the ē-preterits of the type bliov-ē are not necessarily cogent, since it can be argued that the ē-preterit of these forms may owe its existence to secondary extension of the pattern found in all the other ja-presents from simple roots[12] and that the devocalization of u to v would be automatic in the resulting environment between (surface) vowels, his other two arguments

are, on the face of it, well reasoned and convincing.

It is certainly true that it simply won't do to assume, without any ancillary hypotheses, that the ē-preterits of class (c) verbs can be derived from earlier formations in *-jā-, considering that the class (c) verbs do not show a j in their present suffix which would motivate the occurrence of a j in their original preterit suffix, and considering that, as Wiedemann failed to point out, the equally j-less a-presents of class (d) regularly correspond to j-less ā-preterits.

Also the claim that the contracted ē-forms reflect earlier forms in *-ijā-, rather than simple *-jā-, would seem to be attractive, if only because it would account for the difference between contracted and non-contracted forms without violating the principle of the regularity of sound change.[12a] It should, however, be noted that unfortunately Wiedemann failed to specify what, if anything, is the relationship between the two original suffixes *-yā- and *-iyā- and how the dialectal vacillations between contracted and uncontracted forms which had been observed by Schleicher can be explained.

2.3.1: The first (published) attempt to account for the latter difficulties with Wiedemann's view seems to have been that of Sommer (1914).

In his admirable, thoroughly documented study of the nominal evidence,[13] Sommer showed that there is indeed a historical relationship between the suffixes *-jā- (> -io- or -ia-) and *-ijā- (> -ē-). As Sommer pointed out, not only do we find the dialectal vacillations observed by Schleicher (and similar intraparadigmatic alternations, such as N sg. did-ē 'big', G sg. didžios in Kurschat's dialect), more importantly, we find the suffixes *-jā- and -ē- with identical function in denominative and deverbative nominal derivation. Compare m. diev-as 'god' : f. deiv-ē (diev-ē), stumbr-as 'bison' : stumbr-ē, bendr-as 'companion' : bendr-ē vs. svot-as 'father of the bride' : svoč-ia; similarly kūl-ē 'time for threshing' (from kul-ti 'thresh'), or-ē 'time for ploughing' (from ar-ti 'plough') vs. sē-ja 'time for sowing' ( from sē-ti 'sow'). As Sommer correctly observed, this parallelism not only cannot be due to chance but must reflect an original identity in formation. It also would

be impossible to find any other Proto-Indo-European source for the feminizing suffix -ē for which independent, non-Baltic evidence could be found, but the suffix *-ī/yā- (10-11).

The usual practice of identifying the Baltic ē-stem nouns with the Latin fifth declension must be rejected for three reasons. (1) The two types of inflection are functionally virtually incommensurate. (2) There are no convincing lexical equations between the two classes: Of the two equations usually considered probative, that of Li. žvak-ē 'candle' with Lat. faciēs 'face' cannot be maintained; and the equation Li. lap-ē 'fox' : Lat. volpēs (id.) is doubtful.[14] (3) The circumflex intonation of the Lithuanian ē-suffix (as in mus-ẽ 'fly' beside dialectal musià with acute > grave intonation) can hardly be accounted for in any other fashion than by contraction (of an earlier -iā- to -ē-) (13-4).

As for the conditions under which the original suffix *-yā- became *-jā- beside the (dissyllabic) *-iā- which contracted to -ē-, Sommer believed that j was vocalized in word-final syllables in the environment between obstruent consonant and vowel; elsewhere, i.e. in nonfinal syllables and in final syllables in the environment between vowel or diphthong (including the diphthongs of vowel plus nonglide resonant) and vowel, j remained consonantal. Apparent exceptions, such as jūrēs 'sea' beside marios (id.), where both the contracted, originally vocalized and the uncontracted, originally nonvocalized form of the suffix is found, can in Sommer's view easily be explained as owing their existence to leveling.

2.3.2: While Sommer's observations generally are no doubt cogent and correct, his hypothesis concerning the split of original *-yā- into *-jā- and *-iā- (> -ē-) cannot be considered satisfactory.

For while it is certainly true that the vocalic shape of the suffix (i.e. *-iā-) never appears after roots ending in a vowel, thus (virtually) guaranteeing that the vocalic alternant never occurred in that environment, the case is by no means as clear as far as the environment after diphthongs (including diphthongs of vowel plus nonglide resonant) and after consonants is concerned. In all of these environments after

Proto-Indo-European resonant or consonant, both the contracted and the uncontracted forms of the suffix can be found. Thus one finds not only G sg. didēs 'big' beside didžios, but also Sommer's N pl. jūrēs 'sea' beside marios (id.), as well as forms like šlovē 'fame' beside sauja 'handful'.

That is, in environments other than after (single) vowel, both contracted and uncontracted forms are equally found. Sommer's claim that in some of these environments, that is after obstruents, the regular original alternant was *-iā-, and that elsewhere it was *-jā- thus must be considered aprioristic and not supported by the evidence.

A more satisfactory explanation of the Lithuanian (and general Baltic) facts would seem to lie along the lines of the hypothesis most recently proposed in Nagy 1970:49-100.

The main thrust of Nagy's arguments can be summarized as follows: Proto-Indo-European had a rule known as Sievers-Edgerton's Law by which a resonant, expecially a glide resonant, was replaced by a sequence of homorganic vocalic and nonvocalic resonants in the environment after a heavy syllable and before a vowel:

$$R \rightarrow RR \;/\; \left\{ \begin{matrix} \bar{V}R/C(C) \\ \breve{V}R/CC \end{matrix} \right\} ____ \; V$$

This rule would thus provide for suffixal alternations of the type *-yā- after light syllable : *-iyā- after heavy syllable.

While this alternation was at first predictable and automatic, the emergence of an *-iyā-suffix of independent, presumably laryngeal origin (i.e. *-iHā- > *-iyā-), which could occur both after heavy and after light syllable, made the Sievers-Edgerton's Law alternation nonautomatic and opaque. The alternation became even more opaque by the subsequent contraction of *-iyā- to Baltic -ē-.

The door was thus open for generalizations of either of the two alternating suffixes into environments where they were not originally motivated. (The only environment which was excepted from such levelings was the environment after vowel, where because of the general tendency of Lithuanian (and Baltic in general) to avoid vowel clusters, the alternant -ē- could not be introduced.) And, as examples like Standard Li. giria

'forest' : dial. Li. girē indicate, in the nouns these generalizations could differ not only from one lexical item to another, but also from one dialect to another.

2.4: It was apparently because of Sommer's hypothesis, which at least seemed to take care of the objection that Schleicher's and Kurschat's derivation of the ē-preterit by the contraction of *-jā- to -ē- (which was optional in the nouns !) violated the maxim that sound laws operate without exceptions, that a few linguists reaffirmed the belief that the Lithuanian ē-preterit can be derived from earlier formations in *-jā-. Compare on this count Vaillant 1942:156-7 and Schmid 1963:19-22.

However, while these later reaffirmations of Schleicher's and Kurschat's views would, if Sommer's hypothesis could be retained in toto, avoid the objection of violating the principle of the regularity of sound change, they are still open to Wiedemann's first objection, namely that it is difficult to see how the verbs of class (c), with their j-less a-presents, could have wound up with a preterit suffix *-jā-.

Schmid, to be sure, believed that the existence of Tocharian forms like Toch. B campya 'was able' furnishes evidence for a preterit suffix PIE *-yā- which is of independent origin and does not need a corresponding (*-ye/o- >) *-ja-present to motivate it (1963:21-2). However, it is by no means certain that the Tocharian preterit suffix (*)-ā- or (*)-yā- continues a Proto-Indo-Eureopean suffix containing an ā-vowel. For not only is the historical phonology of Tocharian still generally too uncertain to use Tocharian forms as the sole, independent evidence in favor of a particular reconstruction; also, as the correspondence of Toch o to the (*)ā of the other Indo-European languages in Toch. B obl. pokai 'arm' : Gk. Aeol., Dor. pākhus and Toch. B procer 'brother' : Gk. phrātēr etc. shows,[15] there is actually good reason to believe that a Proto-Indo-European ending *-(y)ā- would have yielded Toch -(y)o-*, rather than the attested (*)-(y)ā-.

2.5: A somewhat different revival of the view that the ē-preterit can be derived from original formations in *-jā- was proposed by Schmalstieg

(1960).

According to Schmalstieg, it was only in the environment between j and i that Proto-Baltic *ā̆ (< PIE *ŏ, *ă, as well as *ā before final resonant) became ĕ. Before this ĕ, the preceding j was regularly lost at an early time. Subsequently, the following model existed in the language:

D sg. f., sg. 2 pret. -ai : N sg. f., 3rd pers. pret. -ā

(*-jāi >) -ei : X.

This model then furnished X = -ē.

However, instead of regularizing the inflection of the original *-jā-formations by following the analogy suggested by the above model, it was in Schmalstieg's view also possible to generalize into the forms in -ei (< *-jāi) the a-vocalism found in the rest of the paradigm. This would then account for the continued existence of paradigms like that of valdžia 'rule', G sg. valdžios.

As for the ē-preterit of class (c) verbs, where there was no original motivation for a preterit suffix *-jā-, Schmalstieg suggested that its suffix was secondarily introduced into the transitive verbs of this class from the equally transitive ja-verbs of class (b).

2.6: Schmalstieg's view that the suffix of the class (c) preterits was secondarily introduced into this class and that the motivation for this introduction lay in the fact that the preterit suffix -ē- was reinterpreted as the distinctively transitive preterit marker seems to be a step in the right direction, although one would like to have a more thorough-going discussion and, if possible, documentation of evidence in favor of this view. Interestingly and regrettably enough, it was precisely this essentially acceptable part of his hypothesis which, as indicated in footnote 4 above, Schmalstieg abandoned in subsequent publications.

As for Schmalstieg's phonological and morphological explanation of the origination of the ē-suffixes, however, the extreme rarity of forms in *-jāi in the paradigms of the feminine ā-stems (where only the dative singular and nominative/accusative dual show this ending) and the verbal

formations with ā-suffix (where only the second singular offers this ending) makes it extremely difficult to believe that the Baltic ē-formations could have arisen on the basis of Schmalstieg's above model.

2.7: The evaluation of the various hypotheses advocating the view that all of the Baltic ē-preterits can be derived from earlier preterit formations in *-ā- thus has turned out to be largely negative. Three major problems remain concerning this view.

(1) How would the older preterit suffix *-ij-ā-, presupposed by the attested preterit suffix -ē- (if the latter is indeed of contracted origin), be morphologically motivated, considering that in the presents of class (b) verbs the suffix is *-j-a-, not *-ij-a-?

(2) How can the ē-preterit of (some of the) class (c) verbs be accounted for as derived from an earlier preterit suffix *-ij-ā-, if the corresponding present suffix is *-a-, not *-(i)j-a-? It is true, Schmalstieg has suggested that the ē-preterit of class (c) verbs owes its origin to transfer from the class (b) verbs where -ē- was reinterpreted as the distinctively transitive preterit marker. However, as indicated above, the details of this development and, if possible, supporting evidence for it must still be worked out. Especially, it is necessary to account for the fact that in present-day Standard Lithuanian the presence or absence of the preterit marker -ē- in verbs of class (c) is not necessarily tied up with transitivity; cf. trans. lik-o 'left' with ā-preterit, as well as itr. gim-ē 'was born' with ē-preterit and many other such examples.

(3) The discrepancy in the formation of the preterit participle, noted only by Kurschat, where class (a) verbs have root-final palatalization (cf. laikius-) while class (b) and (c) verbs do not (cf. peikus- and degus-) must be satisfactorily accounted for.

3.1: It is interesting to note that much more satisfactory answers to these problems were given by those linguists who advocate the view that only the ē-preterits of class (a) verbs can be derived from earlier formations in *-ā-.

3.2: Already Wiedemann (1891:197-8) stated that in class (a) verbs, the long -ȳ- of the infinitive stem became -ij- before the preterit marker *-ā- and that the resulting sequence *-ij-ā- regularly contracted to -ē-. In the corresponding preterit participle, the parallel sequence *-ij-us- could not contract, but rather developed to *-j-us- > -'us-, spelled -ius-, by regular change; cf. the development in the genitive plural of nominal ē-stems where the pre-form *-ij-ų wound up as *-j-ų > -'ų, spelled -ių.[16]

Wiedemann's reason for deriving the preterit and preterit participle forms as indicated was that in this way these formations become originally entirely parallel to all the other preterit and preterit participle formations of verbs with a derivational long-vowel suffix in the infinitive:

*pasak-ā-ti : *pasak-ā-j-ā : *pasak-ā-j-us-[17]

*laik-ī-ti : *laik-ī-ā : *laik-ī-us-.

That is, Wiedemann's historical analysis resolves the aberrancy of class (a) verbs (as compared to class (e) verbs) which was noted in 1.5 above.

3.3: Apparently without knowing of Wiedemann's view, Pedersen (1921 and, more accessibly, 1926:11-2) proposed essentially the same hypothesis.

In addition, however, Pedersen offered what he considered positive evidence showing that the ē-preterit of class (b) and (c) verbs must perforce be of different (presumably noncontracted, simple *-ē-) origin from that of the class (a) verbs:

(1) While the preterit participle of class (a) verbs shows root-final palatalization, that of class (b) and (c) verbs does not.

(2) In compound verbs, i.e. in verbs with lexical prefixes, the ē-preterit of class (a) verbs shows no accent retraction, just as the regular ā-preterit shows no accent retraction; on the other hand, however, the ē-preterit of class (b) and (c) verbs does retract the accent in compound verbs:

laĩk-ē = lĩk-o = peĩk-ē

But: iš̃-laĩk-ē = iš̃-lĩk-o ≠ ĩš̃-peik-ē.

3.4: Pedersen's view was accepted as essentially plausible by Stang (1966:382).

However, as Stang correctly observed, the accentual argument in favor of an original difference between class (a) and class (b/c) preterits is not very cogent. For the root accentuation in forms like iš̌-laĩk-ē can be considered analogical, modeled on the constant root accentuation of the corresponding presents; cf. pres. laĩk-o, iš̌-laĩk-o.

It might be added that also the 'mobile' accentuation of class (b) and (c) ē-preterits corresponds to an essentially mobile accentuation of the corresponding presents, although there are some predictable exceptions to this mobility in the present.[18] That is, also the mobility of class (b/c) compound preterits may be analogical. And, if the predictable exceptions in the corresponding presents are original, the exceptionless mobility of the preterit may simply be due to the general tendency of innovated formations or patterns to be more regular than their models.

3.5: Also the lack of root-final palatalization in the preterit participles of class (b/c) verbs is not necessarily a cogent argument in favor of the view that the ē-preterit of these verbs must be of a substantially different origin from that of the class (a) verbs. For the preterit participle is a perfect participle in origin, while the ā- and ē-preterits, whatever their ultimate source, certainly cannot be derived from the Proto-Indo-European perfect. A priori it is thus quite possible that the stem of the preterit participle may be different in origin from that of the corresponding preterit.

That this is not only an a priori possibility, but indeed a probability, is shown by the common Balto-Slavic difference in stem formation between the preterit and preterit participle of the verb 'to be'; cf. table 3.

Considering that the verb 'to be' generally tends to preserve archaisms and that the synchronically quite aberrant Baltic preterits of the verb 'to be' must be archaisms compared to the regular ā- and ē-preterits found in all the other Baltic verbs,[19] the pattern of table 3 can hardly be anything but an archaism (in Balto-Slavic).[20]

TABLE 3

| | INFINITIVE | PRETERIT | PRETERIT PARTICIPLE |
|---|---|---|---|
| OCS | by-ti | bě | by-v-ŭ |
| OPr. | bou-ti | bēi | boū-uns |
| OLatv. | bū-t | bij-a | buewis (= bū-v-is) |
| dial., OLi. | bū-ti | bi-t(i) | buv-us- |

In addition, the (archaic) Balto-Slavic evidence of the verb 'to be' indicates that originally there may well have been a greater formal affinity between the infinitive stem and the preterit participle than between the preterit and the preterit participle; cf. table 3.

That is, the difference between the preterit participles of classes (a) and (b/c) can be accounted for by the fact that the infinitive stem of the former class is characterized by the suffix -y-, while the infinitive stem of the latter is uncharacterized:

inf. *pasak-ā-ti : pret. pple. *pasak-ā-j-us-
*laik-ī-ti : *laik-ī-us-
But: *peik-Ø-ti : *peik-Ø-us-.

This latter difference, however, is due to the general phenomenon that in the infinitive of thematic formations, both those in *-ja- and those in -a-, the thematic suffix is dropped; cf. the evidence in table 1.

3.6: It thus turns out that neither of the two arguments offered by Pedersen in favor of the view that the ē-preterit of class (b) and (c) must be different in origin from that of the class (a) verbs can be considered cogent.

If it then should become possible to find satisfactory solutions to the first two problems outlined in 2.7 above,[21] there would be nothing left standing in the way of reaffirming the view that indeed all of the Baltic ē-preterits can be derived from earlier formations in *-ā-, or rather in *-ij-ā-.

It is the purpose of the rest of this paper to furnish those solutions.

4.1: Returning to the discussion in sections 1.2.1-5 and 1.3 of this paper, the following observations seem to hold true.

(1) The characterized formations of classes (a) and (e), which can be both transitive and intransitive, originally formed their preterit invariably with the suffix *-ā-; cf. the discussion in 3.2 above.

(2) In classes (b) and (d), the generalization holds true that, with but four or five exceptions on either side, the transitive (b) verbs invariably have the ē-preterit, while the intransitive (d) verbs invariably have the ā-preterit.

(3) The class (c) verbs are the only verbs without characterized infinitive stem where the selection of the preterit markers *-ā- and -ē- does not by and large depend on the transitivity or intransitivity of the verb in question, but rather on the shape or ablaut of the root. Notice, however, that in the small subclass (c.iv) which because of its small membership would a priori be more likely to preserve an archaic pattern than the other, large and relatively productive subclasses, the correlation between intransitivity and ā-preterit and (potential) transitivity and ē-preterit resurfaces; cf. 1.2.5 above.

4.2: There is thus a definite tendency in Modern Standard Lithuanian for noncharacterized verbs to have ē-preterits if they are transitive, and ā-preterits if they are intransitive. And the observation made at the end of point (3) of the preceding section would seem to suggest that this tendency is a rather ancient one.

4.3: This view seems to be confirmed if the evidence of Old Lithuanian, dialectal Lithuanian, and (dialectal and Old) Latvian is taken into consideration.

As Endzelīns (1910) has shown, there is a considerable amount of evidence in the East Baltic dialects outside of Modern Standard Lithuanian which indicates that the tendency for transitive verbs to have ē-preterits and for intransitive verbs to have ā-preterits once was considerably stronger than in present-day Standard Lithuanian. Thus, where Modern Standard Lithuanian has the pattern inf. deg-ti 'burn (tr. and

itr.)', pres. deg-a, pret. deg-ē, Old Lithuanian shows the ā-preterit form deg-o with intransitive meaning, and Latvian dialects show a clear opposition between the transitive ē-preterit form sg. 1 dedzu and the intransitive ā-preterit form sg. 1 dęgu. Similar oppositions can be encountered passim outside of Modern Standard Lithuanian.

Endzelīns therefore concluded that there was a stage of Baltic at which all transitive a- and ja-verbs, that is, all transitive verbs of classes (b) - (d), had ē-preterits, and all intransitive verbs of these classes had ā-preterits. At that stage of the language, verbs which can be both transitive and intransitive would have had ē-preterits when used transitively and ā-preterits when used intransitively.

The less transparent distribution of ē- and ā-preterits in present-day Standard Lithuanian, then, is in Endzelīns's view the result of categorial generalizations, such as 'all (nonablauting) a-verbs whose root ends in ĕ + C have ē-preterits', a generalization which accounts for the replacement of older Baltic *deg-a 'burned (itr.)' : *deg-ē 'burned (itr.)' by Modern Standard Lithuanian deg-ē 'burned (tr. and itr.)'.

4.4: While Endzelīns's hypothesis is no doubt on the right track, there is evidence to believe that he overstated his case.

There are a number of verbs like bar-ti 'scold', where a transitive verb has an a-present and ē-preterit in Standard Lithuanian (bar-a : bar-ē), an a-present and ā-preterit in Lithuanian dialects (bar-a : bar-o), and a ja-present and ā-preterit in Latvian (sg. 1 baŕu : baru).

Obviously, it is quite unlikely that Proto-Baltic (or the common ancestor of East Baltic) had all three types of inflection in the same single verb, which is always transitive, and never intransitive. It is much more likely that Stang (1942:104-5) was right in assuming that the original paradigm showed a-present beside ā-preterit, a pattern preserved in some Lithuanian dialects. The ē-preterit of Standard Lithuanian can then be attributed to a tendency toward generalizing the ē-preterit to all transitive verbs. Notice however that this can only be considered a Baltic tendency, since some of the Lithuanian dialects did not parti-

cipate in this innovation, and since quite a different generalization took place in Latvian. For in that language it was the present which was remade, following a tendency (which can perhaps be observed also in some Lithuanian dialects) to generalize the ja-suffix to all transitive presents. This is, of course, not surprising. For like the preterit suffix -ē-, the present suffix *-ja- is usually associated with transitivity. Notice, however, that also in Latvian, this is only a tendency, not a regular across-the-board phenomenon.

The evidence of verbs like barti, then, would seem to indicate that there were indeed once transitive ā-preterits corresponding to transitive a-presents.

The evidence also suggests that in many cases, original transitive ā-preterits were replaced by ē-preterits, while the corresponding a-presents remained unchanged, at least in Standard Lithuanian. That is, there is a definite possibility that the Baltic stage postulated by Endzelīns at which verbs like deg-ti had both an ē-preterit and an ā-preterit, depending on whether they were used transitively or intransitively, was in turn preceded by a stage where transitive a-verbs, just like intransitive a-verbs, only had ā-preterits. Endzelīns's stage would thus only be a way-station along the path of the replacement of original ā-preterits by ē-preterits in the (a-)verbs of class (c).

4.5: In light of this evidence, it would seem indicated to reformulate Enzelīns's hypothesis as follows:

It can be considered quite probable that originally all a-presents had ā-preterits, whether they were transitive or intransitive.

The ē-preterits of class (c) presents actually found in Standard Lithuanian and in the other Baltic dialects then would seem to owe their existence to two chronologically separate processes: (1) The replacement of *-ā- by -ē- in the preterit of transitive a-verbs. (2) The generalization of the ē- and ā-suffixes in the class (c) verbs according to root structure and/or ablaut.

The small subclass (iv) of the Standard Lithuanian class (c) verbs would, under this hypothesis, constitute a relic class which has not (yet)

been affected by the second process.

4.6: Similarly, there is at least one piece of evidence indicating that there were originally intransitive ja-presents with intransitive ē-preterits, beside the usual transitive ja/ē-verbs.

Of the verbs of class (d), only a few have ē-preterits. In all cases, save one, this can be explained as a secondary phenomenon.

Thus, the verb tap-ti 'become' has in the standard language a present ta-m-p-a and a preterit tap-o, as expected in an inchoative-intransitive verb. However, in Prussian Lithuanian, the preterit tap-ē occurs. The explanation of this form can be found if, following Endzelīns (1910:33 with earlier literature), one considers that in the neighboring Prussian Latvian, a present tap-a without nasal infix is attested, a present which no doubt once existed also in Prussian Lithuanian. a-presents of roots ending in ă̄ + C, however, regularly have ē-preterits in Lithuanian; cf. table 2 above. That is, the ē-preterit of Prussian Lithuanian really does not originally belong to a class (d) paradigm, but rather to a class (c.ii) paradigm.

There is only one verb which cannot be explained along the same or similar lines, namely the verb 'to die'; cf. mir-ti, mir-šta, mir-ē.

The intransitive ē-preterit of this verb would, however, find its explanation if it is assumed that originally ē-preterits corresponded to ja-presents, whether they were transitive or intransitive. For originally, the verb 'to die' should have had a ja-present, corresponding to the Proto-Indo-European ye/o-present attested in Skt. mri-ya-te, Av. mir-ye-$^{i}$tē, and Lat. mor-io-r.

The transfer of this verb from the expected original ja-inflection to the sta-inflection in the present tense would, of course, be well motivated by the inchoative-intransitive meaning of the verb. As a matter of fact, this transfer may well have a parallel elsewhere, if my hunch is right that the Prussian Lithuanian (and Latvian) inflection of the verb 'to become' (pres. tap-a, pret. tap-ē) is the more original inflection, while the nasal-infix inflection of Standard Lithuanian (as well as of Standard Latvian) is the result of a transfer of the incho-

ative-intransitive verb 'to become' to the category explicitly marked for inchoativity and intransitivity.

4.7: There would, then, seem to exist sufficient justification for the hypothesis that at a very early stage in Baltic, the distribution of the ē- and ā-preterits was such that, outside of the class (a) and (d) presents which only had ā-preterits, ē-preterits corresponded to ja-presents, irrespective of their transitivity and intransitivity, and ā-preterits corresponded to a-presents, again irrespective of their transitivity and intransitivity.

4.8: It is now possible to extend Wiedemann's and Pedersen's explanation of the ē-preterits of class (a) verbs also to the ē-preterits of classes (b) and (c) which according to the hypothesis outlined in the preceding section of this paper originally corresponded only to presents characterized by the suffix *-ja-.

The original distribution of ā- and ē-preterits (pres. *-a- : pret. *-ā-; pres. *-ja- : pret. *-ē-) postulated in section 4.7 can be rewritten as

pres. *-ă- : pret. *-ā-
pres. *-jă- : pret. *-jā-.

That is, as already Schleicher had recognized, from the point of view of formal parallelism, it is possible to postulate that the ē-preterit originally was a jā-preterit.

The suffix of this preterit, however, just like the suffix *-jā- of the feminine nouns discussed in sections 2.3.1-2 above, would be subject to Sievers-Edgerton's Law, yielding a suffix alternant *-ijā- which, like the nominal *-ijā- and like the *-ij-ā- of the class (a) verbs, would contract to -ē-.

Unlike the feminines, however, the preterits in question almost invariably have heavy root syllables. That is, the Sievers-Edgerton's Law alternant *-ijā- > -ē- must have been the predominantly occurring alternant of the suffix. It is therefore not at all surprising that it should have been generalized throughout the category.

4.9: It is thus possible to reconstruct the paradigms in table 4 as the sources for the paradigms found in classes (a), (b), and (c) of table 1 and sections 1.2.1-4.

TABLE 4

| | INFINITIVE | PRESENT | PRETERIT | PRETERIT PARTICIPLE |
|---|---|---|---|---|
| (a) | *laik-Ī-ti | *laik-ā | *laik-i-ā | *laik-Ī-us- |
| (b) | *peik-Ø-ti | *peik-ja | *peik-jā | *peik-Ø-us- |
| (c) | *deg-Ø-ti | *deg-a | *deg-ā | *deg-Ø-us- |
| | *lik-Ø-ti | *leik-a | *lik-ā | *lik-Ø-us- |

That is, if the discussion of this paper has been at all on the right track, all Lithuanian preterits, with the sole exception of dialectal and Old Lithuanian bi-t(i) 'was, were', can be derived from a unitary original formation characterized by the suffix *-ā-.

NOTES

1 An earlier version of this paper ('On the Lithuanian ē-preterit') was read at the Forty-Sixth Annual Meeting of the Linguistic Society of America, December 30, 1971, at St. Louis, Missouri. I am grateful to Antanas Klimas for subsequently directing my attention to Kazlauskas 1968 and Schmalstieg 1961 and for sending me copies of (the relevant pages of) these publications. The responsibility for any errors and oversights in the present paper, of course, rests entirely with me.

2 Unless indicated otherwise, the examples cited throughout this paper will be taken from Standard Lithuanian. For typographical reasons, ė will here be written ē, and intonations will be marked only where relevant to the discussion.

3 Vaillant, Schmid, and Schmalstieg, to be sure, did not explicitly comment on the origin of $\bar{e}_1$. However, it can be safely assumed that if they had care to do so, they would have derived it in (essentially) the same fashion as $\bar{e}_2$.

4 Note that in subsequent publications (1961 and 1965), Schmalstieg saw fit to derive the ē-preterits of a-verbs (of the type deg-ti, deg-a, deg-ē, deg-us-) in a different fashion, namely as replacements of earlier thematic preterits of the type sg. 1 degĕm, 2 degĕs, 3 degĕ(t). In his opinion, the short thematic vowel (-ĕ-) of these earlier forms was secondarily lengthened on the model of the long suffix vowel of the ā-preterit. The point of contact between the two types of preterits, which made the analogical influence of the ā-preterits on the ĕ-forms possible, consisted in his view in the fact that through shortening of long vowels before final resonant (plus consonant), both types of formations wound up with a short suffix vowel in the first singular, as well as in the third plural (if this form still existed at this time). This brought about the model:

| | | | |
|---|---|---|---|
| sg. 1 | pirk-ă-m | : | deg-ĕ-m |
| (pl. 3 | pirk-ă-nt | : | deg-ĕ-nt) |
| (sg.) 3 | pirk-ā(-t) | : | X = deg-ē(-t) |
| | etc. | | etc. |

This is not the place to discuss the relative merits of Schmalstieg's subsidiary hypothesis. Suffice it to point out that the subsequent discussion of this paper will show that this hypothesis is not required to account for ē-preterits like deg-ē.

5 For further references to publications featuring this view, cf. Endzelīns 1923:666, Sandbach 1930:6-8, and Schmalstieg 1961:93-4.

6 For the distributional (near-)complementarity of the two subvarieties of class (d) verbs, cf. for instance Stang 1966:341.

7 Note that subclass (x) really is only a class of one.

8 Actually, Schleicher started out with short ĭ, which in his view gets lengthened to y in the infinitive.

9 This suffix *-ā- Schleicher in turn considered derived from earlier *-aja-.

10 Schmidt had expressed this view in lectures.

11 For Wiedemann's views on the ē-preterit of class (a) verbs, cf. section 3.2 below.

12 As distinct from the apparent ja-presents of verbs like pasak-o-ja where the -ja- is preceded by a derivational suffix and where the -j- is not really part of the suffix, but is rather inserted between the derivational suffix and the present suffix -a-.

12a There are, to be sure, apparent counterexamples to the assumption that *-ijā- regularly contracted to -ē-, namely noun stems like draug-ijā- 'society' (from draug-as 'friend') and verbal forms like pret. vien-ijo (inf. vien-y-ti). However, neither of these two types of formations can or need be considered very ancient. The noun stems in question are quite evidently borrowings, ultimately going back to (Graeco-)Latin. As for the verbs, dialectal forms in -yjo, pres. -yja make it likely that the forms in -ijo, pres. -ija are of secondary origin; for further arguments in favor of the view that the present (and preterit) inflection of these verbs is of secondary, possibly even nonnative origin, cf. Hock 1971:560-1 with references to earlier literature. The verbs of the type vien-ijo will consequently be disregarded in the subsequent discussion of this paper.

13 It should be noted that Sommer did not cover the verbal evidence.

14 The same conclusions concerning these two equations are reached by Bammesberger in his recent (1970), more satisfactory investigation of these words.

15 As for the vocalism of Toch. B mācer 'mother' : Lat. māter etc., it is likely that it has been influenced by that of the closely associated word for 'father', namely pācer, whose ā is the regular reflex of PIE * ə. Note that no such analogical origin suggests itself for the vocalism of pokai and procer.

16 For Wiedemann's phonological derivation of the preterit participle and similar forms where *-ij- occurs before u-vowel, cf. Wiedemann 1891:183.

17 Recall that the -j- in these forms is, from the synchronic point of view, merely a hiatus breaker.

[18] Compare the synchronic analysis in the Dudas-O'Bryan contribution to this volume.

[19] As a matter of fact, Standard Lithuanian has replaced the aberrant preterit bit(i) by the synchronically regular preterit buv-o.

[20] Note that the Slavic ablaut difference between preterit and preterit participle found in a few verbs like aor. (= pret.) mrě-tŭ 'died' : pple. mĭr-tŭ furnishes additional evidence for the view that the stems of the preterit and preterit participle could originally differ in shape.

[21] The third problem has been taken care of in the two preceding sections (3.4-5) of this paper.

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# PROBLEMS IN THE SYNCHRONIC DERIVATION OF THE LITHUANIAN ē-FORMATIONS.[1]

0.1: In the preceding paper of this volume I have tried to show that not only the nominal (and adjectival) ē-stems of Lithuanian, but also the verbal preterit formations in -ē- can be derived from older formations in (*-jā- or *-ī-ā- >) *-ijā-.

The question arises whether the historical developments postulated in that paper have, as such historical processes often do, left traces in the synchronic structure which would permit (or force) the native speaker to infer underlying forms and phonological derivations identical with, or at least quite similar to, the reconstructed pre-forms and historical processes.

0.2: In order to be able to answer this question, it will be necessary to take a closer look at the synchronic facts.

0.3: In the verbs, the following observations seem to hold true:

0.3.1: As indicated in sections 1.2.1 - 1.5 of the preceding paper, the selection of the preterit marker -ē- is by and large predictable.

0.3.2: Class (a) verbs[2] always have ē-preterits (and preterit participles with palatalized root-final consonant).

0.3.3: Class (b) verbs, with but four or five exceptions, regularly have ē-preterits (but their preterit participles, like those of class (c) verbs, do not show palatalization of the root-final consonant).

0.3.4: Class (d) verbs, again with but four or five exceptions, predictably select the preterit in underlying suffix /ā/, surface o.[3]

0.3.5: Class (e) verbs invariably have ā-preterits.

0.3.6: It is only in class (c) verbs that, at least at first sight,

the distribution of ā- and ē-preterits appears to be unpredictable, both /ā/ and /ē/ occurring quite freely.

However, as pointed out in section 1.2.4 of the preceding paper, closer inspection shows that, with the exception of the small subclass (c.iv), also in the class (c) verbs the distribution of the two preterit suffixes is by and large predictable in terms of root structure and/or ablaut. Even in class (c.iv) it is possible to predict the selection of ā- and ē-preterit, namely in terms of the intransitivity and (potential) transitivity of the verb in question; cf. section 1.2.5 of the preceding paper.

0.3.7: Outside the class (c) verbs, there is thus a formal correlation between present or infinitive suffix on the one hand and the preterit suffix on the other:

Verbs of the type (e), with presents in -v̄-j-a- and infinitives in -v̄-, always have ā-preterits. The same holds true, with only a few exceptions, of the verbs of class (e) with presents in -N...a- (i.e. nasal infix plus -a-) and -sta- and with Ø-suffix in the infinitive.

On the other hand, the verbs of class (b), with their palatal surface present marker -ia- (= [ˈaj]) and their Ø-suffix in the infinitive, regularly have the palatal preterit marker -ē-. Similarly, the verbs of class (a), with present in -ā- and infinitive stem in palatal -y-, have the palatal preterit marker -ē- (as well as palatalization of the root-final consonant in the preterit participle).

0.3.8: However, notice that there is a subclass of class (e) verbs, namely the type inf. vienyti, pret. vienijo discussed in fn. 12a of the preceding paper, which also has a palatal infinitive marker (-y-), but which lacks a preterit in -ē-, showing instead the ā-preterit of the rest of the class (e) verbs.

This subtype of the class (e) verbs further differs from the class (a) verbs in the present inflection. While the latter have a clearly suppletive present stem in -ā-, the verbs of the type vienyti have the type of present regularly expected in a class (e) verb, namely pres. vienija ( : pret. vienijo = pres. pasakoja : pret. pasakojo).

0.4: Concerning the nouns and adjectives, the following observations can be made.

0.4.1: While in the nouns, the relationship between iā- and jā-stems[4] on the one hand and the ē-stems on the other is rather tenuous, being limited to a few alternations between the two types of stems in denominal and deverbal derivation (cf. section 2.3.1 of the preceding paper), in the adjectives, the standard language exhibits a clear and strong relationship between the two types of inflection; cf. the partial paradigms of table 1.

TABLE 1

| | iā-stems | | ē-stems | |
|---|---|---|---|---|
| | indefinite | definite | indefinite | definite |
| N sg. | trečiàs 'third' | trečiójis | dìdēs ~ didžiàs 'big' | didžiójis |
| G sg. | trečiõs | trečiõsios | dìdēs ~ didžiõs | didžiõsios |
| G pl. | trečių̃ | trečiųjų | didžių̃ | didžiųjų |
| | jā-stems | | cf. ā-stems | |
| N sg. | sējà (noun) 'time for sowing' | | gerà | gerójі |
| G sg. | sējõs | | gerõs | gerõsios |
| G pl. | sējų̃ | | gerų̃ | gerųjų |

Note that in the definite forms of the adjectival ē-stems, certain Lithuanian dialects offer -ē- instead of the Standard Lithuanian -io-; cf. Senn 1966:166.

0.4.2: A similar relationship (between ia- or ja- and i/y-stems)[5] exists in the corresponding masculine adjectives; cf. table 2.

TABLE 2

| | ia-stems | | i/y-stems | |
|---|---|---|---|---|
| | indefinite | definite | indefinite | definite |
| N sg. | trẽč-ias '3rd' | trẽč-iàs-is | dìd-is 'big' | did-ỹs-is ~ didž-iàs-is |
| G sg. | trẽč-io | trẽč-io-jo | dìdž-io | dìdž-io-jo |
| G pl. | trẽč-iũ | trẽč-iũ-jų | didž-iũ | didž-iũ-jų |

| | ja-stems | ji-stems | cf. a-stems | |
|---|---|---|---|---|
| N sg. | kraũ-jas (noun) 'blood' | kū́-jis (noun) 'hammer' | gẽr-as 'good' | ger-às-is |
| G sg. | kraũ-jo | kū́-jo | gẽr-o | gẽr-o-jo |
| G pl. | krau-jũ | kū́-jų | ger-ũ | ger-ũ-jų |

Note that as the data of table 2 show, in the i/y-stems, the selection between -i- and -y- depends on the accent. If the suffix is accented, the long alternant -y- is chosen. In unaccented environment, the alternant -i- is found.

Notice also that while, except for the genitive plural, the inflection of the ē-stems shows -ē- throughout the paradigm, thus consistently differing from the jā-stems with their /-jā-/, the inflection of the i/y- and ji-stems differs from that of the ia- and ja-stems only in the nominative, accusative, vocative, locative, and illative singular. Elsewhere, i.e. in the genitive, instrumental, and dative singular, and in the whole plural and dual, the two inflections are identical.

0.4.3: The following additional remarks hold true for the distribution of iā-, jā-, ē- and ia-, ja-, ji-, i/y-stems.

The occurrence of the iā-, ia-, and i/y-suffixes, over against that of the jā-, ja-, and ji-suffixes, is predictable. The former occur after consonant, the latter after vowel. Note that -ē- occurs only after consonant.

However, the selection of the iā/jā-suffix over that of the ē-suffix, and the selection of -ia/ja- over -i/y/ji- does not seem to follow any discernable pattern.

What is predictable, however, is the relationship between masculine and feminine adjectives. If the masculine is of the type in -ia/ja-, then the corresponding feminine is of the type in -iā/jā-. If the masculine is of the type in -i/y-,[6] the corresponding feminine is of the type in -ē-.

0.4.4: Beside the adjectives and nouns so far discussed, Modern Standard Lithuanian also has stems in -ijā-; cf. the evidence in fn. 12a of the preceding paper.

No relationship, such as alternations or semantic similarity, seems to exist between these nouns and the iā/jā/ē-stems.

0.5: Concerning the formations discussed in sections 0.3(.1-8) and 0.4.1-3 above, the following phonological observations can be made

0.5.1: In the inflection of the iā/jā/ā- and ia/ja/ji/i/y/a- stems (as well as in other noun and adjective classes), there is in certain endings of the paradigm an alternation between long, tense vowels or diphthongs which occur in the definite forms of the adjective, and short vowels which occur in the indefinite forms; cf. the nominative singular forms in table 1, as well as forms like the instrumental singular masculine indef. trečiù : def. trečiúoju.

This alternation between long vowels or dipthongs on the one hand and short vowels on the other is accompanied by an alternation between acute intonation on the one hand and grave accent on the other. Endings with circumflex intonation, however, do not participate in this alternation; cf. the genitive singular and plural forms in table 1.

Although the alternation between -y- and -i- in the i/y-stems appears to follow the same pattern, the principle governing that alternation must be different. For as indicated in section 0.4.2 above, in the i/y-stems the selection of the long or short alternant of the suffix depends on whether the suffix is accented or not. In the other stems, however, the evidence referred to above shows that the alternation between long vowel (or diphthong) and short vowel does not depend on the place of the accent.

For further data and details on the patterns of alternations which are independent of accent placement; cf. Kenstowicz 1971:76-7.

0.5.2: An analogous alternation can be found in most of the endings of the verb; cf. class (c) liek-ũ 'I leave' : reflexive liek-úo-s(i).

However, in the inflection of present and preterit formations characterized by the suffixes -ā- and -ē- (without any further suffixes preceding the personal endings), only the short alternant of these endings is found in postvocalic position; cf. pret. lik-a-ũ, refl. lik-a-ũ-s(i); similarly class (a) laik-ia-ũ, refl. laik-ia-ũ-s(i).

For further data and details, cf. Senn 1966:223 and Kenstowicz 1971: 54-5.

0.5.3: A phenomenon which is also found both in the nouns and in the verbs is the alternation of the accent between contiguous syllables, such that usually the accent is on the first of the two successive syllables if that syllable has circumflex or (nonalternating) grave intonation, and on the second syllable if that syllable has acute intonation or grave intonation which alternates with acute intonation in the fashion described in 0.5.1 above. Compare on this count 3rd pers. liẽk-a(-s(i)) vs. sg. 1 liek-ũ, liek-úo-s(i). For further data and details, cf. Senn 1966:223-4 and Kenstowicz 1971:78-9.

0.5.4: A different accent alternation, which can only be observed in the nouns and adjectives, cannot be defined in terms of phonetic environment, but only in terms of category. Thus, in certain a/ia/ja-stems, cases like the nominative singular always have root (or stem) accentuation (cf. N sg. trẽč-ias), while other cases always have the accent on the case ending; cf. G pl. treč-iũ with circumflex intonation i.e. not with the grave/acute intonation which would condition the accent shift noted in 0.5.3 above. Cf. also Kenstowicz 1971:81-5.

0.5.5: In nouns and adjectives with monosyllabic root and circumflex intonation on the root (when the root is accented), both of the two processes noted in 0.5.3 and 0.5.4 above can be observed.

Compare the similarities and differences between the inflections of monosyllabic trẽč-ias '3rd' and polysyllabic vẽdin-as 'leading' in table 3.

TABLE 3

| | | |
|---|---|---|
| N sg. m. | trẽčias | vẽdinas |
| I sg. m. | trečiù | vẽdinu |
| G pl. m.,f. | trečių̃ | vedinų̃ |
| N sg. f. | trečià | vedinà |
| I sg. f. | trečià | vẽdina |

Here, in accordance with the pattern observed in 0.5.4, the accent is on the root in the nominative singular masculine and in the instrumental singular masculine and feminine; it is on the ending in the genitive plural masculine/feminine and in the nominative singular feminine. The pattern observed in 0.5.3 accounts for the suffix accent found in the instrumental singular masculine and feminine of the inflection of trẽčias.

0.5.6: Beside the alternation between long vowels or diphthongs and short vowels noted in 0.5.1-2, another similar alternation between long and short vowels is found, which however is not restricted to endings and where there is no qualitative difference between the long and short alternants.

Like the alternation between -y- and -i- in the i/y-stems, this alternation is dependent on the place of the accent, as in 3rd pers. dẽg-a 'burns' = [d'ɛ̃:ga][7] vs. sg. 1 deg-ù = [d'ɛgū]. However, outside of the suffix of the i/y-stems, this alternation appears to be limited to the low vowels, written e and a.

This alternation occurs both in the nouns and in the verbs. However, the precise phonetic conditions under which it occurs may differ from category to category; cf. Senn 1966:70-1, Kenstowicz 1971:2-4.

0.5.7: On the surface, all consonantal segments of Lithuanian, with the exception of j which always is palatal, can be either palatal or nonpalatal. While palatal consonant quality is predictable before front vowels, where only palatal segments occur, it is not predictable before back vowels where both palatal and nonpalatal consonants can be found.

The complementary distribution between ia/i/y- and ja-, iā- and jā- suffixes noted in section 0.4.3 above would seem to suggest that the palatal quality of consonants before back vowels is underlyingly identical with j. This view would seem to be supported by the fact that in word-initial position, [p'] and [b'], unlike the other palatalized consonants, are followed by a noticeable glide [j] in the environment before back vowel; cf. Dambriūnas-Klimas-Schmalstieg 1966:17.

0.5.8: While in most consonants there is no (appreciable) phonetic difference between the palatal alternant found before front vowel and the palatal alternant found before back vowel, there is a considerable difference in the consonants which appear as palatal dental stops ([t', d']) before front vowel. For these alternate with palatal affricates ([č', ǰ'], spelled či, dži) before back vowels. Compare the inflection of dìdis in tables 1 and 2. Similarly, the class (a) preterits offer alternations in the dentals of the type sg. 1 mačiau 'I saw', 3rd pers. matė̃.

0.5.9: The same surface pattern is suggested by the orthographic representation of partial paradigms like N sg. m. svẽčias 'guest', V sg. svẽte. However, phonetically the facts are more complicated. For the phonetic surface vowel of both endings is [ɛ]. Thus we find [s'v'ɛ:t͡č'ɛs] with [ɛ] just like [s'v'ɛ:t͡t'ɛ].

However, notice that no [a(:)] occurs after surface palatals, making it likely that in this environment the difference between [a] and [ɛ] is neutralized. This impression is reinforced by comparing the ia-stem forms svẽčias and svẽte with the corresponding a-stem forms, such as rãtas 'wheel' : rãte, with their clear surface distinction between a ([a]) and e ([ɛ]).

0.5.10: In the verbs, the suffixes -ā- (i.e. surface -o-) and -ē- seem to alternate with -ă- and -iă- or -ĕ- before vowel; cf. 3rd pers. pres. māt-o, pret. māt-ē vs. sg. 1 mat-ă-ū, mač-iă-ū, sg. 2 mat-ă-i, mat-ĕ-i. In the case of the short suffixes -ă- and -iă/jă-, the suffix vowel seems to be lost entirely in the same environment; cf. 3rd pers. liẽk-a, peĩk-ia vs. sg. 1 liek-ù, peik-i-ù, etc.

0.5.11: In the nouns, a somewhat similar phenomenon is observed. Before the vowel(-initial) suffix -ų̄ (= [u:]) of the genitive plural, the vocalic part of the stem suffixes -a/ia/ja/ji- and ā/iā/jā- seems to be lost entirely; cf. the evidence in tables 1 and 2.

The pattern is quite similar in the genitive of ē-stems (of the type G sg. f. didž-iū̃), where however the vowel is not lost entirely without trace. For a trace of the palatal quality of the suffix -ē- appears to be preserved in the palatal quality of the root-final consonant (and in the occurrence of the affricated alternant of dental stops).

0.5.12: This pattern of the ē-stem genitive plural is, at least superficially, reminiscent of the root-final palatalization which appears in the preterit participle of class (a) verbs; cf. 0.3.2 above.

1.1: Concerning the synchronic interpretation of the facts noted in sections 0.3 - 0.5.12 of this paper, the traditional, pre-generative grammars not surprisingly are generally of little help.

1.2.1: Thus, Senn (1966:104), following the tradition of Lithuanian grammarians, classifies the nouns under discussion as follows:

Class I: (A) Nouns and adjectives in -as, -jas, -ias,
(B) Nouns and adjectives in -is, -ys;
Class II: (A) Nouns and adjectives in -a, -ia,[8]
(B) Nouns and adjectives in -ē.

The only value of this classification for the purposes of the present discussion is that it seems to indicate that, if perhaps not for the usual native speaker of Lithuanian, at least for the traditional grammarian,

there is a definite relationship of some (unspecified) sort between the subclasses IA and IB, and IIA and IIB respectively, and that there is a parallelism of some (undefined) sort between the differences of class IA vs. IB and the differences of class IIA vs. IIB.

1.2.2: Except for stating that the class (a) verbs take the ē-preterit (283), Senn offers no attempt to relate present and preterit inflection, although on p. 258-79 he gives an extensive list of the various correspondences existing between the class (b) and (c) presents on the one hand, and the ā- and ē-preterits on the other.

1.2.3: As for the phonological patterns observed in 0.5.1-12 of this paper, Senn is generally content with listing the evidence, if he makes a statement at all.

Only in respect to the occurrence of palatal and nonpalatal consonant alternants (and of palatal dentals vs. palatal affricates) does Senn offer anything approaching an explanation.

In his view, palatal consonants owe their existence to palatalization before front vowel or j (65). Senn here seems to implicitly assume that palatalization before back vowel is brought about by an originally intervening j which subsequently was lost. The basis for this assumption presumably consisted in the facts observed in section 0.5.7 above.

As far as the alternation between palatal dental stops and palatal affricates is concerned, Senn states that ti, ty, di, dy become či, dži before 'hard' (i.e. back) vowels (65). This is, of course, merely a graphemic statement, designed to account for the graphemic alternations in forms like gaidỹs 'rooster' : G sg. gaĩdžio and dìdis 'big' : dìdžio. The statement is in conflict with Senn's implicit derivation of those palatal consonants which occur before back vowel from sequences of nonpalatal consonant plus j. However, the observation that the critical environment for the assibilation of palatal dental stops is the environment before back vowel must be considered significant and worthy of note; for it seems to accurately reflect the communis opinio of traditional (twentieth-century) Lithuanian grammarians.

1.3: Also the discussion in Dambriūnas-Klimas-Schmalstieg 1966 is, partly because the book was designed as a language text book, of very limited usefulness.

While the authors do not offer any explanations concerning palatalization and assibilation, and while, in the classification of the nouns, they follow the same, traditional lines as Senn (cf. p. 32), on p. 67 they do provide at least for a (partial) description of the generalizations which can be made about the relationships between present (or infinitive) stem and preterit stem: Class (b) presents[9] usually have the ē-preterit. Many class (c) verbs take the ā-preterit. Verbs of class (a) 'drop the [infinitive ending] -yti' and add the suffix -ē-.

2.1: Within a framework approximating that of generative phonology, Robinson (1970:124) posits the following two rules which are to account for palatalization and assibilation:

(13) tj --> č ; dj --> ǰ.

(14) 'Palatalize any consonant before a front vowel; Cj and C'j become C'.'

However, Robinson fails to provide for an explicit motivation for positing an underlying j. In addition, his rules fail to account for the fact that the assibilated dental stops always are palatal (či and dži).

Finally, because of the subject-matter of his paper, Robinson does not offer any explanations concerning the morphological relationships outlined in sections 0.3.1-8 and 0.4.1-3 of this paper.

2.2: It is only in Kenstowicz 1971 that the pioneering first steps toward an explanation of the facts outlined in 0.3.1-8, 0.4.1-3, and 0.5.1-12 are made, although it should be noted that Kenstowicz did not (plan to) treat the derivation of the preterit participles and of the nouns under discussion. As will be seen in the subsequent discussion,[9a] this failure is unfortunate, since it is the evidence of these formations which will necessitate the revision of a number of pivotal rules.

2.2.1: To account for the accent alternations observed in 0.5.3 above, Kenstowicz (p.91) postulates the following rule:

De Saussure's Law (DSL):

$$\begin{bmatrix} +\text{ syll.} \\ +\text{ stress} \\ +\text{ lo tone} \end{bmatrix} \quad C_1 \quad \begin{bmatrix} +\text{ syll.} \\ +\text{ hi tone} \end{bmatrix}$$

$$1 \qquad 2 \qquad 3$$

$$\text{--> } 1 \qquad 2 \qquad 3$$

$$[-\text{stress}] \qquad [+\text{ stress}]$$

Concerning Kenstowicz's derivation of [+ hi tone] and [+ lo tone], cf. ibid.: 89. For the purposes of this paper, [+ hi tone] and [+ lo tone] will be considered underlying; in phonological derivations, they will be marked by [H] and [L], where necessary.

2.2.2: As far as the accent alternations of the type noted in 0.5.4 above are concerned, Kenstowicz assumes that nouns of this type have underlyingly unaccented stems, while nouns which do not participate in these alternations have underlyingly accented stems. For further details, cf. ibid.: 81-5.

2.2.3: In order to account for the alternations between long vowels or diphthongs and short vowels observed in 0.5.1 above, Kenstowicz (ibid.:77) posits the following rule, here revised to agree with his implicit revision of the rule on p. 97-8.

Leskien's Law (LL): $V \text{ --> } \emptyset \; / \; \begin{bmatrix} V \\ H \end{bmatrix} __(s) \; \#$.

This is no doubt the correct formulation, if DSL above is accepted as formulated by Kenstowicz. For it is precisely the same (type of) vowels--namely those characterized by the feature [H]--that attract the accent according to DSL, which also undergo LL.

Notice that in order for LL to apply, long vowels must be represented in sequence, rather than feature representation; i.e. ā = /aa/, not /ā/.[10]

An additional rule must be postulated to account for the surface alternation between ger-à and ger-ó-ji (def.); cf. ibid.: 38.

Tensing:

$$\begin{bmatrix} +\text{ syll.} \\ -\text{ hi} \\ +\text{ long} \end{bmatrix} \text{ --> } \begin{bmatrix} -\text{ lo} \\ +\text{ tense} \end{bmatrix}$$

Note that this rule must apply to long vowels in feature, rather than segment representation.[10] A marking convention subsequently rounds the raised /ā/ to [ō]; cf. ibid. 53 and 59.

The difference between ger-à and ger-ó-ji then reflects the difference in derivation exemplified in table 3.[11]

TABLE 3

| | /ger-$\underset{H}{a}$a #/ | /ger-$\underset{H}{a}$a-ji #/ |
|---|---|---|
| LL | ger-$\underset{H}{a}$ # | ---------- |
| Tensing | -------- | ger-$\underset{H}{ō}$-ji # |
| Surface | ger-à | ger-ó-ji |

2.2.4: Concerning the similar alternation between long vowels or diphthongs and short vowels in the verbs (cf. section 0.5.2 above), Kenstowicz (ibid.: and ) proposes the following rule.

Final Shortening (FS): $\begin{bmatrix} + \text{ syll.} \\ - \text{ stress} \end{bmatrix}$ --> ∅/ ___ #.

Kenstowicz does not offer any independent evidence for this rule. The only possible evidence of this nature would consist in the fact that final -i can be optionally deleted in the third person of certain verbs (cf. myl(-i) 'love(s)') and in the reflexive marker -s(i) (cf. 3rd pers. myl-i-s(i)). However, the very optionality of this final i-deletion does not inspire great confidence in its value as independent evidence for FS.

As a matter of fact, elsewhere, final -a and -e remain in strata of the language which nevertheless consistently have Kenstowicz's FS in the verb endings outside the third person.[12] Thus, the third person of class (b) and (c) verbs never loses its final underlying /a/; cf. peik-ia and deg-a. Kenstowicz, to be sure, argues that this final -a simply must be marked as an exception to FS. 'Presumably the retention of the a here can be attributed to the fact that the third person ending was originally t as it

is in Slavic and Indo-European generally.' (53) However, considering the fact that also the underlying final /e/ of the vocative singular of a/ia/ja-stems does not undergo FS and that the comparative Indo-European evidence shows that this ending never was followed by a consonant, Kenstowicz's argument cannot be considered cogent.

A much more satisfactory solution suggests itself if the fact is considered that two of the endings in which Kenstowicz's FS rule applies, namely the first and second singular endings -ù# ~ -úo- and -ì# ~ -íe- condition DSL; cf. deg-ù, deg-úo-s(i) vs. 3rd pers. dẽg-a(-s(i)). For as noted in section 2.2.3 above, the attraction of the accent from a preceding syllable by DSL is conditioned by the presence of the same feature as the application of LL, namely the feature [H].

That is, the two processes are intimately linked in the nouns, suggesting that they are similarly linked in the verbs, so that the endings of the first and second singular, which do attract the accent according to DSL, should also undergo LL.[13] This not only would avoid the difficulties with Kenstowicz's FS, it would also explain the parallelism between adj. ger-ù : ger-úo-ju and vb. deg-ù : deg-úo-s(i). And although DSL does not apply in the first and second dual and plural (-me : -mẽ-s(i), -te : -tẽ-s(i), -va : -vo-s(i), -ta : -to-s(i)), because in these forms the vowels of the root and the ending are not in contiguous syllables (cf. dẽg-a-me), as required by DSL, simple parallelism strongly indicates that also here we are faced with the application of LL, rather than FS.

Kenstowicz's FS thus is not needed or justified, although an (optional) rule of the following nature is required.

Final deletion (FD): i --> ∅ / ___# [Vb.; 3rd pers.; reflex.]

Note that this rule must apply after LL, as shown by the derivations in table 4.

TABLE 4

| | /deg-$\underset{H}{\text{uo}}$-si #/ | | /deg-$\underset{H}{\text{uo}}$-si #/ |
|---|---|---|---|
| FD | deg-$\underset{H}{\text{uo}}$-s # | LL | ---------- |
| LL | deg-u-s* | FD | deg-úo-s |

2.2.5: As for the fact that the first singular ending always shows the alternant -u(-), never -uo-, even in the reflexive, of verbal formations in -ē- and -ā- (cf. 0.5.2 above), Kenstowicz suggests an explanation which ties in this fact with the facts noted in section 0.5.10 above, by postulating the following rules.

Glide formation (GF): $\begin{bmatrix} +\text{ hi} \\ +\text{ syll.} \end{bmatrix}$ --> [-syll.]/ ___ + [+ syll.] (36). This rule requires segment, rather than feature representation of length; cf. inf. ly-ti 'pour' (= /lii-ti/) : pret. lij-o (from /lii-aa/), not ljo* (from /lī-ā/); cf. ibid.

Metathesis: $\begin{bmatrix} +\text{ syll.} \\ -\text{ hi} \\ \alpha\text{ back} \end{bmatrix}_1 \begin{bmatrix} +\text{ syll.} \\ +\text{ hi} \\ \alpha\text{ back} \end{bmatrix}_2$ --> 2 1. (54).

Vowel truncation (VT): V --> ∅ / VV (a mirror-image rule). (56).

j-loss: j --> ∅ / C ___. (9.).

Backing: e --> a / ___ u. (57).

The application of these rules can be seen in the sample derivations of table 5.[14]

There appears to be ample precedent for GF and j-loss, making the assumption of these two rules quite safe. However, as far as the other three rules are concerned, the evidence is not as certain.

TABLE 5

| | /deg-a-au#/ | /miil-i-au-si#/ | /laik-ee-au(-si)#/ |
|---|---|---|---|
| GF | --------- | miil-j-au-si# | ---------- |
| Metathesis | deg-a-ua# | miil-j-ua-si# | laik-ee-ua(-si)# |
| $VT_1$ (/ __ VV) | deg-ua# | ---------- | laik-e-ua(-si)# |
| $VT_2$ (/ VV __) | --------- | ---------- | laik-e-u(-si)# |
| FS | deg-u# | miil-j-ua-s# | laik-e-u(-s)# |
| j-loss | --------- | miil-ua-s# | ---------- |
| Backing | --------- | ---------- | laik-a-u(-s)# |
| | degu | myliuos | laikiau(s) |

It is true, there is good independent evidence that Lithuanian has a metathesis rule as formulated above; cf. alternations like that between inf. duo-ti 'give' and pret. dav-ē (= /dau-ti/ and /dau-ee/ in Kenstowicz's analysis, with u --> w --> v / V __ V). However, in Kenstowicz's analysis of the first singular ending, there is no surface evidence whatsoever for an ending -au- which alternates with the ending -uo- and would thus motivate the speaker's inferring that the underlying ending is /au/, rather than the uo appearing on the surface.

As for the VT rule, there is certainly good evidence that some such rule should exist; for the underlying forms of table 5 are well motivated by the fact that the respective stem vowels (-a-, -i-, or -e-) are clearly attested in the surface representations of all forms of the paradigm, except the first and second singular; cf. for instance 3rd pers. deg-a, pl. 1 deg-a-me, 2 deg-a-te, du. 1 deg-a-va, 2 deg-a-ta. However, the formulation of Kenstowicz's vowel truncation rule is questionable. For as the genitive plural of such formations as the ē-stems shows, with its root-final palatalization and assibilation which clearly indicates the underlying presence of the palatal suffix -ē-, the vowel truncation rule must be formulated as follows; cf. the derivations in table 6.[15]

Vowel truncation revised (VTR): (V)V --> ∅ / ___ VV.

TABLE 6

| Kenstowicz's derivation | | My derivation | |
|---|---|---|---|
| | /did-ee-uu/ | | /did-ee-uu/ |
| $VT_1$ | did-e-uu | | |
| $VT_2$ | did-e-u | VTR | did-uu |
| Backing | did-a-u | | |
| | didžiau* | | didžių |

The function of this revised rule is of course identical to that of Kenstowicz's rule, namely to be part of a conspiracy of rules designed to avoid vowel clusters longer than two morae. Also the application of GF in the derivation of myliu, as well as in that of davẽ (from /dau-ee/, with the additional development of w --> v / V __ V), can be considered to serve this purpose. Notice the similar purpose of the j-insertion found in present and preterit formations of the type (inf. pasak-o-ti :) pres. pasak-o-j-a, pret. pasak-o-j-o.

As for Kenstowicz's Backing rule, not only is it an ad-hoc rule, without synchronic precedent, but more importantly (for, as will be seen shortly, it is not always possible to avoid invoking ad-hoc rules), the reformulation of VT (to VTR) makes the Backing rule unnecessary; cf. the derivation in table 7.[15] In addition, as the derivation in table 7 shows, with the revised rule VTR, there is now indeed surface evidence for an underlying suffix /au/, whose metathesis to uo is blocked after long-vowel suffix;[16] elsewhere, however, /-au/ does metathesize to /-ua/, as in (/dirb-a-au/ --> /dirb-au/ --> /dirb-ua/ (--> dirbũ). On the other hand, however, as is also shown by the evidence of the derivations in table 7, the following, new ad-hoc rule is required for the derivation of the second singular ending of the ẽ-preterit.

Fronting: $a \rightarrow e \; / \; \begin{bmatrix} + \text{syll.} \\ + \text{front} \end{bmatrix} __ \; i.$

The only defense which I can offer for this rule is that there seems to be no way around it and that, as an assimilatory rule in the environment between front vowels, it is phonetically plausible.[16a]

TABLE 7

| | sg. 1 /laik-ee-au/ | sg. 2 /laik-ee-ai/ | /deg-aa-ai/ |
|---|---|---|---|
| Fronting | ---------- | laik-ee-ei | --------- |
| VTR | laikiau | laikei | degai |

2.2.6: To account for the facts noted in 0.5.6 above, Kenstowicz introduces the following rule:

Secondary lengthening (SL): $\begin{bmatrix} \text{+ syll.} \\ \text{+ stress} \\ \text{- hi} \end{bmatrix}$ --> [+ long]

/ ___ $\begin{matrix} \text{[- sonor.]} \\ \text{[+ sonor.]}_1 \end{matrix}$ [+ syll.]. (6).

If, as seems likely, the alternation between -i- and -y- in the i/y-stems is to be considered the result of a similar process, this process would have to be formulated as follows:

Minor lengthening (ML): $\begin{bmatrix} \text{+ syll.} \\ \text{+ stress} \\ \text{+ hi} \\ \text{+ front} \end{bmatrix}$ --> [+ long] / [i/y-stem endings].

The categorial environment of this rule would at first glance appear to make the rule circular in its formulation. However, what is here meant by 'i/y-stems' is 'those stems in nominative singular /-is/ which have a genitive singular in surface -io, etc.'

2.2.7: Concerning the facts noted in 0.5.7 above, Kenstowicz (ibid.: 8) proposes the following, quite acceptable rule:[17]

Palatalization (Pal.): [+ cons.] --> [+ pal.] / ___ [+ syll., + front] .

This rule must be ordered before VTR and j-loss; cf. the derivations in table 8.

2.2.8: In his formulation of the assibilation of dental stops noted in 0.5.8 above, Kenstowicz (ibid.:58) follows the tradition of the grammarians (cf. 1.2.3 above) by setting up the following rule.[18]

Assibilation (Ass.): [- grave, - cont.] --> [+ comp., + strid.] / ___ [+ syll., + back] .

This rule must be ordered after VTR and j-loss; cf. the derivations in table 8.[19]

Although this rule makes it possible to derive the desired surface forms and although it agrees with the tradition of the grammarians, this rule suffers from the fact that the environment for the assibilation is quite an unnatural one. Assibilations of this sort seem to occur much more naturally before front segments, especially before the semivowel j, than before back vowels.

TABLE 8

| | /did-ee-u$\underset{L}{\overset{+}{u}}$ #/ | /v$\underset{L}{\overset{+}{e}}$rt-i-$\underset{H}{\overset{+}{u}}$ #/ |
|---|---|---|
| GF | ---------- | v$\underset{L}{\overset{+}{e}}$rt-j-$\underset{H}{\overset{+}{u}}$ # |
| Metathesis | ---------- | v$\underset{L}{\overset{+}{e}}$rt-j-$\underset{H}{\overset{+}{u}}$a # |
| Pal. | d'id'-ee-u$\underset{L}{\overset{+}{u}}$ # | v'$\underset{L}{\overset{+}{e}}$rt'-j-$\underset{H}{\overset{+}{u}}$a # |
| VTR | d'id'-u$\underset{L}{\overset{+}{u}}$ # | ---------- |
| DSL | ---------- | v'$\underset{L}{\overset{+}{e}}$rt'-j-$\underset{H}{\overset{+}{u}}$a # |
| LL | ---------- | v'$\underset{L}{\overset{+}{e}}$rt'-j-$\underset{H}{\overset{+}{u}}$ # |
| j-loss | ---------- | v'$\underset{L}{\overset{+}{e}}$rt'-$\underset{H}{\overset{+}{u}}$ # |
| Ass. | didžiu | verčiu |

A more natural derivation could be achieved by having the following two j-loss rules and by revising Ass. The rules would then have to be ordered as indicated in table 9.

$j\text{-loss}_1$: $\quad j \rightarrow \emptyset \;/\; C__ \begin{bmatrix} + \text{syll.} \\ + \text{front} \end{bmatrix}$

Ass. revised (Ass.R): $\quad \begin{bmatrix} - \text{grave} \\ - \text{cont.} \end{bmatrix} \rightarrow \begin{bmatrix} + \text{comp.} \\ + \text{strid.} \end{bmatrix} \;/\; __\; j$

$j\text{-loss}_2$: $\quad j \rightarrow \emptyset \;/\; \begin{bmatrix} C \\ (-\text{lab.}) \end{bmatrix} ____ [+ \text{syll.}]$

There is ample evidence from such languages as Germanic and Latin indicating that j-loss$_1$ is a very common and natural development. Similarly, Ass.R is, as already indicated earlier, a very natural rule. Only the very language-specific j-loss$_2$ rule cannot be claimed to be natural on universal principles. However, given the present analysis, it is clearly needed for Lithuanian, and it would seem to be supported by the fact noted in section 0.5.7 above, namely that (initial) palatalized labials before back vowels are (still) followed by a noticeable j-offglide.

TABLE 9

| | N sg. m. /svet-jas/ | V sg. m. /svet-je/ |
|---|---|---|
| Pal. | s'v'et'-jas | s'v'et'-je |
| j-loss$_1$ | ---------- | s'v'et'-e |
| Ass.R | s'v'ečʼ-jas | --------- |
| j-loss$_2$ | s'v'ečʼ-as | --------- |
| | <u>svečias</u> | <u>svete</u> |

It might be argued that the present reformulation of j-loss and Ass. leads to a very abstract analysis, not directly suggested by the surface

evidence. Although this is quite true, there is a possible counterargument, namely that the reformulation agrees with the historical sequence of sound changes corresponding to the revised synchronic rules; cf. the evidence in Stang 1966:100-4.

A more serious objection would be that the present reformulation fails to account for the palatalization and assibilation in forms like G pl. didžių (cf. table 8), where there is, in the present analysis, no evidence for an underlying j which could condition Ass.R. I will leave this objection unanswered at this point. For as the subsequent discussion in this paper will show, there is one possible alternative analysis of the underlying form of forms like didžių which makes it possible to retain the above reformulation. On the other hand, it will also be shown that ultimately it is better to retain Kenstowicz's original formulation than the above reformulation.

2.2.9: Although Kenstowicz does not account for the data observed in section 0.5.9 above, it is easy enough to do so by means of the following, low-level rule, which quite evidently must be ordered after Kenstowicz's Ass. or after the j-loss$_1$ of my reformulation and which has the effect of fronting an [a] to [ɛ] after palatal segments.

Low vowel neutralization (LVN): $\begin{bmatrix} +\text{ syll.} \\ +\text{ lo} \\ -\text{ long} \end{bmatrix}$ --> [+front]/[+ pal.] ___

2.2.10: As noted earlier, in respect to the facts noted in sections 0.3.1-8 and 0.4.1-3 above (about the Lithuanian ē-formations), Kenstowicz is concerned only with the derivation of the ē-preterit.

According to Kenstowicz (p. 62-3), the frequent correspondence between ja-present and ē-preterit might suggest that the preterit marker -ē- is to be derived from underlying /jā/. However, to his mind, sets like a-present (not ja-present!) deg-u : ē-preterit deg-iau cast considerable doubt on such a derivation.

Kenstowicz therefore proposes the derivation given in section 2.2.5, table 6 above. However, as noted in that section, Kenstowicz's derivation breaks down once it is extended to the nouns. A different formulation therefore would seem to be indicated.

3.1: As shown in section 2.2.5 (with sections 2.2.7-8) above, a derivation of the relevant forms of the ē-stem nouns and adjectives and of the ē-preterits is possible as shown in table 10.

TABLE 10

| | /did-ee/ | /did-ee-uu/ | /laik-ee/ | /laik-ee-au/ |
|---|---|---|---|---|
| Pal. | d'id'-ee | d'id'-ee-uu | laik'-ee | laik'-ee-au |
| VTR | -------- | d'id'-uu | -------- | laik'-au |
| Ass. | -------- | d'idž'-uu | -------- | ---------- |
| | didē | didžių | laikē | laikiau |

3.2: However, the following objections can be raised against this analysis.

3.2.1: The analysis has to resort to Kenstowicz's Ass. rule which, as indicated in 2.2.8, suffers from the fact that it has an unnatural environment.

3.2.2: The analysis does not account for the fact that the preterit participles corresponding to ē-preterits of class (a) verbs show root-final palatalization (and assibilation, where possible), while those corresponding to the ẽ-preterits of class (b) and (c) verbs do not.

This objection might be countered by repeating the historical claim (cf. section 3.5 of the preceding paper) that the preterit participle need not have the same underlying structure as the preterit, but may rather agree with the infinitive in formation; cf. table 11. It is true, this would require that GF exceptionally apply to the feature, rather than segment representation of the long -y- of the infinitive marker. However, considering the vacillation between feature and segment representation found in Lithuanian phonology in general, this need not be considered an insurmountable obstacle. As a matter of fact, it may be claimed that the evidence that GF must apply to the segment representation is limited to (monosyllabic) roots which occur in word-initial position, while on the other hand the infinitive marker -y- always forms part of a di- or polysyllabic stem, is by definition not a root, and, again by definition, never occurs in word-initial position. The only possible counterevidence to this claim, namely that of verbs like inf. dal-ý-ti 'part, deal out', pres. dal-ìj-a, pret. dal-ìj-o, is not cogent. For considering that all other infinitive markers of the language are charactacterized by underlying long vowel and high tone, it is quite likely that the speakers of the language have abstracted a generalization about the morpheme structure of the infinitive marker which specifies that all infinitive markers are characterized by underlying long vowel and high tone. This would permit the analysis of the present and preterit formations as dal-ì-j-a and dal-ì-j-o, i.e. with stem vowel

(short) -ĭ- and with regular j-insertion, while the long vowel of the infinitive would owe its existence to the above infinitive morpheme structure generalization. Note that this analysis of the verbs in inf. -ý-ti, pres. -ì̯a, pret. -ì̯o would seem more acceptable than the only possible alternative interpretation which would consider the long -ý- of the infinitive underlying and the short -ì- of the present and preterit derived. For this interpretation would have to presuppose a shortening rule of -ý- to -ì- which is not only ad-hoc and unprecedented, but which also is contradicted by the evidence of the long -y- occurring in the same environment (i.e. before j) in the surface representations of the locative singular of ia-, i/y-, and i-stems; cf. L sg. svetyje.[20]

TABLE 11

| | /laik-ī-us-/ (cf. /laik-ī-ti/) | /deg-us-/ (cf. /deg-ti/) |
|---|---|---|
| Pal. | laik'-ī-us- | d'eg-us- |
| GR | laik'-j-us- | -------- |
| j-loss | laik'-us- | -------- |
| | laikius- | degus- |

Though the derivation of table 11 may indeed be possible, there is under the present analysis, no plausible evidence for the claim that the preterit participle should be formally closer to the infinitive than to the preterit. For in the standard language, the difference between pret. bit(i) and pret. pple. buv-us- (cf. inf. bū-ti), which was of considerable importance for the historical argument in favor of original *-ī-us-, no longer exists, bit(i) having been replaced by buvo; cf. fn. 19 of the preceding paper.

If, then, there is a possible alternative analysis under which the derivations of table 11 (or some other derivations) are more plausibly motivated, that analysis would definitely have to be preferred.

3.2.3: The relationships between the nouns and (especially) the adjectives in -i/y/ji- and -ē- on the one hand and those in -ia/ja- and -iā/jā- on the other remain unaccounted for.

Similarly, the aberrancy in preterit formation of the class (a) verbs, as compared to the other verbs with infinitive stem in long vowel (i.e. the class (e) verbs), remains unaccounted for.

Finally, even though the existence of correspondences like pres. deg-a : pret. deg-ē casts doubt on the automaticity of having an underlying preterit marker /jā/ correspond to a present marker /ja/, it may still appear desirable to formally account for the fact that presents in /ja/ do indeed, with but four or five exceptions, correspond to preterits in surface -ē-.

4.1: It is not difficult to find an analysis which takes care of the objections to the above, first reformulation of Kenstowicz's analysis.

4.2: This analysis would accept the following relevant rules discussed in sections 2.2.1-10 above. For the sake of the reader's convenience in rechecking on the function of those rules, I am adding after each rule the section(s) in which it has been discussed and established.

GF . . . . . 2.2.5
Fronting . . . . . 2.2.5
Metathesis . . . . . 2.2.4
Pal . . . . . 2.2.7
VTR . . . . . 2.2.5
DSL . . . . . 2.2.1 and 2.2.4
LL . . . . . 2.2.3-4
Tensing . . . . . 2.2.3
j-loss$_1$ . . . . . 2.2.8
Ass.R . . . . . 2.2.8
j-loss$_2$ . . . . . 2.2.8
ML . . . . . 2.2.6

4.3: In addition, the following rules are required.

j-insertion: $\emptyset \rightarrow j \;/\; +\,(V)V\,+\,\underline{\quad}\,+\,V(V)$ [suffix] [verbs]

Since the function of this rule is the same as that of GF, namely to eliminate vowel clusters of more than two morae, this rule would most naturally seem to be ordered as a co-equal of GF. Note that the verbs of class (a) will have to be marked as an exception to j-insertion, and as exceptionally undergoing GF applying to the feature, rather than segment representation.[21]

Categorial vowel raising (CVR):

$$\begin{bmatrix} +\text{ syll.} \\ +\text{ lo} \\ -\text{ short} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{ front} \\ -\text{ hi} \end{bmatrix} \;/\; \begin{bmatrix} -\text{ hi} \\ +\text{ front} \end{bmatrix} \underline{\quad} \text{ [suffix]}$$

That is, /a/ --> /i/ and /a:/ --> /e:/ in the specified environments. The rule has to apply after GF and before Fronting.

The categories in which CVR takes place are the preterit (in the environment after consonant), the whole inflection of the ē-stem nouns and adjectives (although in the adjectives, this rule does not apply in the definite forms and is only optional in the indefinite forms; cf. table 1 above), and in the nominative, accusative, locative, and illative singular of the i/y-stems (although in the nominative singular of the definite adjectives, the application of this rule is optional; cf. table 2 above.

Note that the /e:/ resulting from /a̋:/ by CVR does not undergo LL (as would be expected from a vowel with underlying high tone) and appears with circumflex (rather than acute or grave) intonation on the surface. For the purposes of this paper it is assumed that this aberrant behavior is the direct result of the application of CVR, i.e. that in addition to the changes described above, CVR also brings about the change of an underlying high tone to low tone. I realize that other interpretations of the facts are possible; however, since the discussion of this paper would seem to remain unaffected by whatever interpretation is chosen, I will forego a detailed investigation as to what interpretation is most likely to be the correct one.

4.4: On the basis of these rules, it is then possible to formally characterize the relationships noted in sections 0.3.2-7 and 0.4.1-3 above, as

(1) reflecting an underlying identity in formation between the nouns and adjectives in -ia/ja- and -iā/jā- on the one hand and those in -i/y/ji- on the other; cf. the derivations in table 12.[22] (The only difference between the former and the latter stems lies in the fact that the latter are marked for (optionally) undergoing CVR.)

(2) reflecting an underlying parallelism in the preterit and preterit participle formation (including the selection of preterit marker) of class (a) and class (b) verbs; cf. the derivations in table 13.[22]

(3) reflecting a formal relationship between the present suffix /ja/ and the preterit suffix /jā/; cf. table 14.[22] In the case of the ē-preterits of class (c) verbs it would, under this analysis, have to be assumed that, under certain, generally specifiable conditions (cf. 0.3.6 above), a-verbs get marked for exceptionally selecting the preterit suffix /jā/, rather than /ā/.

4.5: In addition to the advantages listed in the preceding section, the present, second reformulation of Kenstowicz's analysis can be considered to have the following points in its favor.

The rules accounting for palatalization and assibilation are natural and faithfully reflect the historical developments which brought about palatalization and assibilation.

The proposed derivations account for all the ē-formations in essentially the same fashion, thus mirroring the historical unity of these formations. It is true, the analysis does not exactly mirror the historical developments. But that is to be expected, considering the introduction of new sequences in -ija- and -ijā- into the language (cf. sections 0.3.8 and 0.4.4 above).

This faithful mirroring of the historical developments by the present analysis would by many linguists be considered to render it definitely preferable to the first reformulation of Kenstowicz's analysis.

TABLE 12

| | /gaid-j$\overset{+}{\underset{L}{a}}$s #/ | /d$\overset{+}{\underset{L}{i}}$d-j$\overset{+}{\underset{L}{a}}$s #/ | /k$\overset{+}{\underset{L}{u}}$u-j$\overset{+}{\underset{L}{a}}$s #/ | /did-j$\overset{+}{\underset{H}{a}}$a #/ |
|---|---|---|---|---|
| CVR | gaid-j$\overset{+}{\underset{L}{i}}$s# | d$\overset{+}{\underset{L}{i}}$d-j$\overset{+}{\underset{L}{i}}$s# | k$\overset{+}{\underset{L}{u}}$-j$\overset{+}{\underset{L}{i}}$s# | did-j$\overset{+}{\underset{L}{\varepsilon}}$# |
| Pal. | gaid'-j$\overset{+}{\underset{L}{i}}$s# | d'$\overset{+}{\underset{L}{i}}$d'-j$\overset{+}{\underset{L}{i}}$s# | ------- | d'id'-j$\overset{+}{\underset{L}{\varepsilon}}$# |
| VTR | ---------- | --------- | ------- | --------- |
| LL | ---------- | --------- | ------- | --------- |
| Tensing | ---------- | --------- | ------- | d'id'-j$\overset{+}{\underset{L}{\tilde{\varepsilon}}}$# |
| j-loss$_1$ | gaid'-$\overset{+}{\underset{L}{i}}$s# | d'$\overset{+}{\underset{L}{i}}$d'-$\overset{+}{\underset{L}{i}}$s# | ------- | d'id'-$\overset{+}{\underset{L}{\tilde{\varepsilon}}}$# |
| Ass.R | ---------- | --------- | ------- | --------- |
| j-loss$_2$ | ---------- | --------- | ------- | --------- |
| ML | gaid'-$\overset{+}{\underset{L}{\tilde{i}}}$s# | --------- | ------- | --------- |
| | gaidỹs | dìdis | kū̀jis | didẽ |

| | /did-j$\overset{+}{\underset{H}{a}}$a #/ | /did-j$\overset{+}{\underset{H}{a}}$a-ji #/ | /did-j$\underset{H}{a}$a-u$\overset{+}{\underset{L}{u}}$ #/ |
|---|---|---|---|
| CVR | --------- | ---------- | (did-j$\overset{+}{\underset{L}{\tilde{\varepsilon}}}$-$\overset{+}{\underset{L}{\tilde{u}}}$#) |
| Pal. | d'id'-j$\overset{+}{\underset{H}{a}}$a# | d'id'-j$\overset{+}{\underset{H}{a}}$a-ji# | d'id'-jɛ$\underset{L}{\varepsilon}$-u$\overset{+}{\underset{L}{u}}$# |
| VTR | --------- | ---------- | d'id'-j-u$\overset{+}{\underset{L}{u}}$# |
| LL | d'id'-j$\overset{+}{\underset{H}{a}}$# | ---------- | ---------- |
| Tensing | --------- | d'id'-j$\overset{+}{\underset{H}{\tilde{a}}}$-ji# | ---------- |
| j-loss$_1$ | --------- | ---------- | ---------- |
| Ass.R | d'idž'-j$\overset{+}{\underset{H}{a}}$# | d'idž'-j$\overset{+}{\underset{H}{\tilde{a}}}$-ji# | d'idž'-j-$\overset{+}{\underset{L}{\tilde{u}}}$# |
| j-loss$_2$ | d'idž'-$\overset{+}{\underset{H}{\tilde{a}}}$# | d'idž'-$\overset{+}{\underset{H}{\tilde{a}}}$-ji# | d'idž'-$\overset{+}{\underset{L}{\tilde{u}}}$# |
| | didžià | didžióji | didžiũ |

TABLE 13

| | /laik-ĭ-ā-au/ | /laik-ĭ-ā-ai/ | /laik-ĭ-ā/ | /laik-ĭ-us-/ |
|---|---|---|---|---|
| GF | laik-j-ā-au | laik-j-ā-ai | laik-j-ā | laik-j-us- |
| CVR | laik-j-ɛ̄-au | laik-j-ɛ̄-ai | laik-j-ɛ̄ | ---------- |
| Fronting | ---------- | laik-j-ɛ̄-ɛi | -------- | ---------- |
| Pal. | laik'-j-ɛ̄-au | laik'-j-ɛ̄-ɛi | laik'-j-ɛ̄ | laik'-j-us- |
| VTR | laik'-j-au | laik'-j-ɛi | -------- | ---------- |
| Tensing | ---------- | ---------- | laik'-j-ē | ---------- |
| j-loss$_1$ | ---------- | laik'-ɛi | laik'-ē | ---------- |
| j-loss$_2$ | laik'-au | ---------- | -------- | laik'-us- |
| | laikiau | laikei | laikē | laikius- |

| | /kiib-aa-aa-au/ | /kiib-aa-aa-ai/ | /kiib-aa-aa/ |
|---|---|---|---|
| j-insertion | kiib-aa-j-aa-au | kiib-aa-j-aa-ai | kiib-aa-j-aa |
| CVR | ---------- | ---------- | ---------- |
| VTR | kiib-aa-j-au | kiib-aa-j-ai | ---------- |
| Tensing | kĭb-ŏ-j-au | kĭb-ŏ-j-ai | kĭb-ŏ-j-ŏ |
| | kybojau | kybojai | kybojo |

| | /kiib-aa-us-/ |
|---|---|
| j-insertion | kiib-aa-j-us- |
| CVR | ---------- |
| VTR | ---------- |
| Tensing | kĭb-ŏ-j-us- |
| | kybojus- |

TABLE 14

| | /pɛik-jaa-au/ | /pɛik-jaa-ai/ | /pɛik-jaa/ | /pɛik-us-/ |
|---|---|---|---|---|
| CVR | pɛik-jɛ̄-au | pɛik-jɛ̄-ai | pɛik-jɛ̄ | --- |
| Fronting | --- | pɛik-jɛ̄-ɛi | --- | --- |
| Pal. | p'ɛik'-jɛ̄-au | p'ɛik'jɛ̄-ɛi | p'ɛik'-jɛ̄ | p'ɛik-us- |
| VTR | p'ɛik'-j-au | p'ɛik'j-ɛi | --- | --- |
| Tensing | --- | --- | p'ɛik'-jē | --- |
| j-loss$_1$ | --- | p'ɛik'-ɛi | p'ɛik'-ē | --- |
| j-loss$_2$ | p'ɛik'-au | --- | --- | --- |
| | peikiau | peikei | peikē | peikus- |

4.6: However, in addition to the fact noted in section 2.2.8 above, that the present derivation of palatalization and assibilation is quite abstract, it is precisely the evidence of historical change (of the analogical/morphological variety) which makes parts of the present analysis quite unacceptable.

For the generalization of the preterit marker -ē- to the transitive class (c) verbs and the later generalizations (in these verbs) of *-ē- and *-ā- in terms of root structure and/or ablaut (cf. sections 4.2-8 of the preceding paper in this volume) would be quite inconceivable if the morphological and phonological relationships between *-ja- and *-jā- > -ē- and between *-a- and *-ā- had still been felt to be transparent and automatic. These generalizations would rather seem to indicate that the (presumable) original transparency and automaticity of these relationships had been lost.

The reason for this loss may well have been the fact that, while the generalizations in the nouns and adjectives did not entirely eliminate the surface alternations between the suffixes *-jā- and *-ē-, the generalization of *-ē- (at the expense of *-jā-) was complete in the preterit (cf. section 4.8 of the preceding paper), leaving no alternations as evidence of a relationship between *-ē- and *-jā- or the present suffix *-jă-.

Also from the purely synchronic point of view, the present analysis is objectionable, at least as far as the derivation of the ē-preterit of class (c) verbs is concerned. For as indicated in section 4.4 of this paper, those class (c) verbs which because of their root structure and/or ablaut take the ē-preterit must be marked for exceptionally selecting the preterit suffix /jā/. However, as noted in section 1.2.4 of the preceding paper in this volume, in some of the subclasses which normally take the ē-preterit because of their root structure and/or ablaut, there are verbs which exceptionally do not take the ē-preterit, but rather select the ā-preterit. The fact that under the present analysis, these verbs will have to be marked as exceptions to the exceptional selection of the preterit suffix /jā/ by class (c) verbs does not inspire great confidence in this analysis.

4.7: On the other hand, however, in the verbs of class (a), the evidence of the otherwise parallel class (e) verbs combined with the surface evidence of the root-final palatalization found in the preterit participle would strongly support the present analysis and would just as strongly militate against either of the two preceding analyses.

Similarly, as already indicated, though generalizations did take place in the nouns and in the adjectives (just as they did in the preterit) their extent and effect were much more limited. As a result, there are still synchronic alternations in the nouns and especially in the adjectives which would lead the speaker of the language to infer that the suffixes -ē- and -jā-, as well as the parallel masculine suffixes -i/y/ji- and -ja- (which outside of the nominative, accusative, vocative, locative, and illative singular have identical inflection), should indeed be underlyingly identical.

5.1: The discussion in sections 4.6-7 would thus suggest that, rather than rejecting the second reformulation of Kenstowicz's analysis in its entirety, one should revise it to the extent that /jā/ and /ī-ā/ are still considered underlying for the ē-stem nouns and adjectives and for the ē-preterits of class (a) verbs.

However, as far as the class (b) and (c) verbs are concerned, the preterit suffix -ē- must in this, final reformulation be considered to be underlying. Any regular relationship between present suffix (or present root shape and/or ablaut) and preterit suffix in these verbs (as well as in class (d) verbs) must then be considered to be governed by morphological selection rules (whatever their precise nature), rather than by phonological rules with or without categorial information, just as the selection of the present suffix /ā/ and the infinitive/preterit/preterit participle stem suffix /ī/ in the class (a) verbs is governed by morphological, rather than phonological rules.

5.2: The present, final reformulation of Kenstowicz's analysis doesnot entail any introduction of new rules or any reformulation or reconsideration of old rules, except for the rules accounting for palatalization and assibilation. For as the derivations in tables 15 and 16 show,[23] the set of rules Pal., j-loss$_1$, Ass.R, j-loss$_2$ fails to account for the forms with underlying /ē/, while Kenstowicz's Pal., j-loss, Ass. very well account for both the forms with underlying /ē/ and the forms with underlying /jā/ or /ī-ā/.

Considering the reservations about the abstractness of the set of rules Pal., j-loss$_1$, Ass.R, j-loss$_2$, first noted in section 2.2.8 above, and considering that Kenstowicz's formulation agrees with the (implicit) formulation of the tradition of Lithuanian grammarians, the fact that the rejection of this set of rules leads to the acceptance of Kenstowicz's less natural rules cannot be considered a great loss.

TABLE 15

| | /mat-ī-ā-au/ | /mat-ī-ā/ | /ved-ē-au/ | /ved-ē/ |
|---|---|---|---|---|
| GF | mat-j-ā-au | mat-j-ā | --------- | ------ |
| CVR | mat-j-ē-au | mat-j-ē | --------- | ------ |
| Pal. | mat'-j-ē-au | mat'-j-ē | v'ed'-ē-au | v'ed'-ē |
| VTR | mat'-j-au | -------- | v'ed'-au | ------ |
| j-loss$_1$ | --------- | mat'-ē | --------- | ------ |
| Ass.R | mač'-j-au | -------- | --------- | ------ |
| j-loss$_2$ | mač'-au | -------- | --------- | ------ |
| | mačiau | matē | vediau* | vedē |

TABLE 16

| | /mat-ī-ā-au/ | /mat-ī-ā/ | /ved-ē-au/ | /ved-ē/ |
|---|---|---|---|---|
| GF | mat-j-ā-au | mat-j-ā | --------- | ------ |
| CVR | mat-j-ē-au | mat-j-ē | --------- | ------ |
| Pal. | mat'-j-ē-au | mat'-j-ē | v'ed'-ē-au | v'ed'-ē |
| VTR | mat'-j-au | -------- | v'ed'-au | ------ |
| j-loss | mat'-au | mat'-ē | --------- | ------ |
| Ass. | mač'-au | -------- | v'edž'-au | ------ |
| | mačiau | matē | vedžiau | vedē |

5.3: While it is thus possible to (approximately) recapitulate the historical developments in the synchronic phonological derivation of the ē-stem nouns and adjectives, as well as of the ē-preterits of class (a) verbs, such a recapitulation is precluded in the phonological derivation of the ē-preterits of class (b) and (c) verbs (and of the four or five class (d) verbs with ē-preterit), as well as in the rules accounting for palatalization and assibilation.

This is, of course, not surprising, since there is no a priori reason that all historical changes should be reflected in the synchronic phonological rules. What is interesting, however, is the fact that it was precisely the evidence of historical change of the morphological/analogical

variety (cf. section 4.6 above) which constituted one of the arguments against a complete recapitulation of the historical developments in the synchronic rules.

Note finally the interesting fact that, as far as the derivation of the ē-nouns and adjectives and ē-preterits of class (a) verbs from underlying /jā/ and /ī-ā/ and of the ē-preterits of class (b), (c), and (d) verbs from underlying /ē/ is concerned, the present synchronic analysis is in total agreement with the historical interpretation of Wiedemann, Pedersen, and Stang (cf. sections 3.2-4 of the preceding paper). This would suggest that the reason for the failure of this historical interpretation to come to the conclusions reached in the preceding paper of this volume lies in the fact that it essentially remained a (valid) synchronic analysis.

FOOTNOTES

[1] An earlier version of this paper was read before the Linguistics Seminar of the University of Illinois at Urbana-Champaign, November 18, 1971. I am indebted to Karen Dudas, Michael Kenstowicz, and Margie O'Bryan for reading and commenting on an earlier draft of this paper. The responsibility for any errors or omissions found in this paper, of course, is entirely my own.

[2] For the formal characteristics, subclasses, and examples of the verb classes referred to in this paper, cf. sections 1.2.1-5 of the preceding paper. -- Here, as in the preceding paper, for typographical reasons the ė of Modern Standard Lithuanian orthography is rendered as ē, and intonations are marked only where relevant to the discussion.

3 For convincing arguments that surface (long) o derives from underlying /ā/; cf. Kenstowicz 1972:37-9.

4 For the (conditions for the) development of underlying /ā/ to surface a or o in the nouns, cf. Kenstowicz's (1972:76-8) formulation of Leskien's Law.

5 Note that the (suffixal) i of forms like trẽčias, trečià, trečiũ merely is a graphemic device to mark the palatalization of the preceding consonant, while the suffixal i of forms like dîdis is a real segment; i.e. the i of ia or iã ≠ the i of i/y.

6 Masculine adjectives in -ji- do not seem to occur in the standard language.

7 In phonetic transcriptions and phonological derivations, I follow Kenstowicz's (1971) practice of marking the (placement of the) accent by a raised $^{+}$.

8 Also nominal and adjectival stems in nominative singular -i are included in this subclass. However, they will be of no interest to the discussion of this paper.

9 I am retaining my own classification of the verbs in this (indirect) quote.

9a In the remaining discussion of this paper, references will have to be made passim to Kenstowicz's dissertation (1971). Since a thorough discussion of many of Kenstowicz's rules (and their motivations) appeared to be in order, it often has seemed advisable to quote his rules verbatim and to summarize his arguments for them in extenso, rather than simply referring the reader to the relevant passages in Kenstowicz's dissertation, even if this at times may appear to have resulted in digressions from the main topic of this paper and in a certain degree of redundancy.

10 For a discussion of the (recurrent) need in Lithuanian phonology to alternate between feature and segment representation of long vowels, cf. Kenstowicz 1970.

11 Here as elsewhere, the switch from segment to feature representation (or vice versa) implicit in the derivation will not be explicitly marked. The output of a given rule will, however, be given in the representation required by that rule.

12 It is true, in certain strata of Standard Lithuanian and in the fast speech of probably all strata of the (standard) language, there is a general FS (or a categorially restricted FS) which does affect all short vowels in all final syllables. However, what is important for the present discussion is the fact that there are strata of Standard Lithuanian which do have Kenstowicz's verbal FS, without having it in the third person or outside of the verbs.

13 Kenstowicz comes close to admitting this in his fn.5 (on p. 65). But for some unexplained reason he fails to draw the necessary conclusions.

14 For the rule introducing the palatalization in myliuos and laikiau(s), cf. sections 2.2.7-8 below. As for the -uo- of myliuos, it should be noted that though spelled -uo- in the orthography of Standard Lithuanian, this diphthong is pronounced more like [ua] or [ue] than like [uo]; cf. Senn 1966:73.

15 For the palatalization (and assibilation) of the surface forms, cf. sections 2.2.7-8 below. -- Note that 'Kenstowicz's derivation' in table 6 is not actually a derivation proposed by Kenstowicz; it is rather the derivation which would result by applying Kenstowicz's rules to the required underlying form in /-ee-uu/.

16 This is not surprising, since Metathesis is only a minor rule, as shown by the surface occurrence of nonmetathesized au in forms like aug-ti 'grow'.

16a Note that in order to have the natural rule Fronting, the ending of the second singular has been considered to be underlyingly /-ai/, rather than Kenstowicz's /-ei/. The fact that in the second singular reflexive of verbs like those of class (c), the metathesized ending appears as -ie- (cf. deg-ie-s(i)) does not constitute counterevidence against underlying /-ai/. For not only is there an independently motivated, general, low-level rule changing a to e after palatal segments (cf. section 2.2.9 below), there is also independent evidence for /-ai/ metathesizing to surface -ie-; cf. a-stem N pl. noun diev-ai 'gods' vs. adj. ger-ie-ji 'the good ones'. -- Additionally, it should be observed that VTR has to precede DSL, thus permitting the accent shift in contiguous syllables to occur in sg. laikiaũ (vs. 3rd pers. laĩkẽ). Note, however, that LL does not apply to the nonmetathesized endings of the first and second singular (cf. laikiaũ, not laikia*). Similarly, the surface intonation of the nonmetathesized first and second singular endings is circumflex, not the acute normally corresponding to the underlying high tone which conditions DSL. These two last-mentioned facts are no doubt tied up with the fact that we are here dealing with falling diphthongs (i.e. diphthongs of the shape Vowel + Semivowel). There is no independent evidence for falling diphthongs undergoing LL, suggesting that these diphthongs are exceptions to that rule. Similarly, there are no surface representations of final falling diphthongs with acute intonation, suggesting that there is an output condition converting all acute intonations on final falling diphthongs into circumflex intonations. It might be argued that it would be more elegant and efficient to formulate the latter condition as a relatively early rule changing [H] to [L] in final falling diphthongs and thus preventing the subsequent application of LL. There is no good synchronic evidence against this argument, although the fact that there are Lithuanian dialects where the endings of the nonmetathesized first and second singular appear as surface -áu, -ái/éi, i.e.

with acute intonation, but without application of LL, makes it likely that the (re)ordering of [H] --> [L] before LL, if it is psychologically real at all, would have to be a rather recent innovation of Standard Lithuanian.

17 Because of the apparent antonymy between Kenstowicz's term 'Sharping' and the term 'soft' traditionally used to refer to the palatalized consonants, I have changed Kenstowicz's term (and the feature designation 'sharp') to the more neutral term 'palatalization' (and feature designation 'palatal').

18 In keeping with the terminology employed in the rest of this paper, I have changed the name of this rule from Softening to Assibilation.

19 Note that there is no clear evidence concerning the ordering of LL, except that it has to follow Metathesis.

20 Note that it would not be possible to resolve the problem concerning the needed exceptional application of GF to the feature representation of the long -y- by ordering VTR before GF (thus deleting the first i of an underlying /-ii-us-/ and then applying GF to the remaining single i). For as the evidence of the derivation of myliuos and verčiu (cf. tables 5 and 8 above) shows, GF must take precedence over VT(R).

21 For arguments in favor of the view that such an exceptional application of GF can be justified, cf. section 3.2.2 above.

22 To distinguish between the tensed long ē-vowels and the nontensed (long or short) e-vowels, the latter are here represented by ɛ.

23 The examples chosen are the preterit first singular and third person of class (a) matyti 'see' and class (c) vesti, pres. veda 'lead'. No distinction is made between tensed and nontensed low vowels.

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